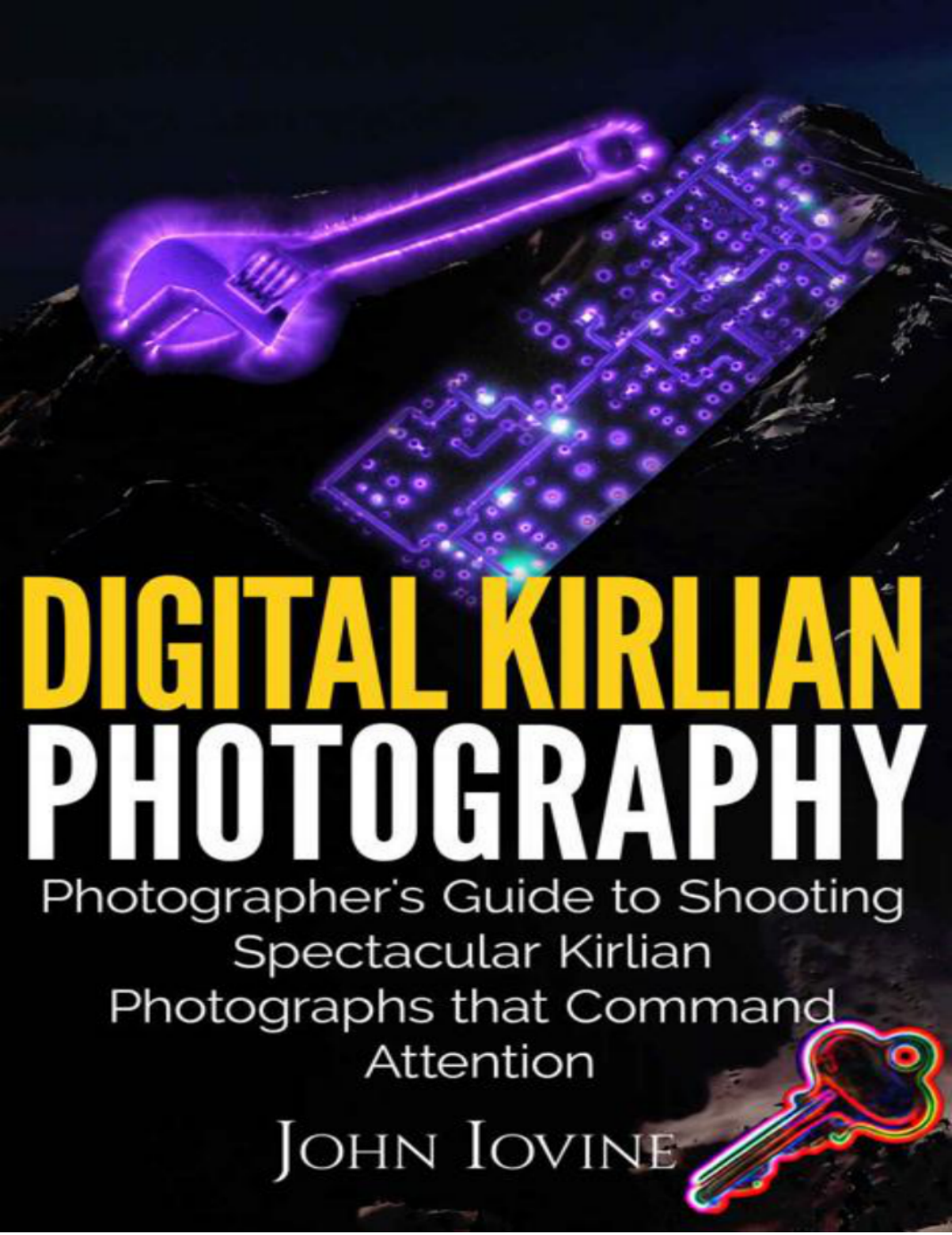

DIGITAL KIRLIAN PHOTOGRAPHY

Photographer's Guide to Shooting Spectacular Kirlian Photographs that Command Attention

JOHN IOVINE

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by

John Iovine

Warning

By participating in the photography experiments contained in this book, you will be working with and near high voltage electricity, which can produce dangerous or lethal shocks. You agree not to hold the author or Images SI, Inc. liable for any injury or damage related to the use, misuse or to the performance of the information contained in this book. Please be careful and follow all directions and warnings contained within this book.

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Introduction

I have written on Kirlian photography for over two decades. This book focuses on using digital cameras to capture Kirlian images. My first book, “Kirlian Photography – A Hands on Guide” was written over 20 years ago, focused on using sheet film for capturing Kirlian images.

In the intervening years since my first book’s publication, I occasionally dusted off my equipment, made a few modifications and took a few more images. One major change that has occurred is the switch to digital cameras and photography. In keeping up with the new equipment, I have written new material. This material shows how to use digital cameras, iPhones and low light video cameras for capturing Kirlian images.

I have compiled this information into this book. In addition, I have added material for using photo-editing programs, like Adobe Photoshop, to reduce noise, enhance and colorize the resulting images.

I have also updated the Kirlian high voltage power supply circuits. The new power supplies are more versatile and easier to build. You will find everything you need to create stunning Kirlian photographs in this book.

The Paranormal Claims of Kirlian Photography

There are numerous Kirlian devices being sold on the internet today. Some companies, in an effort to sell their devices, claim the corona discharge in the resulting Kirlian images to be either paranormal or contain biological information that can be decrypted by the company's researchers. All my research to date shows the corona discharge can be explained by employing known physical laws, whether the images are of people or inanimate objects. With people, changes in the subject's skin resistance, which may be due to factors like stress, lying, illness, fatigue, alcohol consumption, etc. can change the appearance of the corona discharge. These are physiological changes that easily explain the differences seen in the corona discharge. It is not necessary to create a paranormal bio-plasma field to explain the differences seen in the corona discharge. Other physical variables, that influence the corona discharge and the resulting Kirlian image of both animate and inanimate subjects, as described by Stanford researcher William Tiller, include the object's pressure against film, air humidity, air pressure, voltage, frequency, and exposure time. If anyone has any evidence to the contrary, I would be more than happy to examine that data.

My company sells Kirlian equipment. However we have never made any "paranormal" claims to sell our Kirlian photography devices. Our devices can make brilliant Kirlian photographs. If one wants to do paranormal research with our devices, that's fine. Just know we make no claim that any interpretation of the corona discharge is due to anything other than standard physical parameters or physiological changes as previously mentioned. If you discover something different, please let me know. I am open to examine any new data that comes along.

John Iovine 2016 NYC

Chapter 1

What is Kirlian Photography?

Kirlian (pronounced kur'-lee-uhn) *photography,* is sometimes called *electro-photography, electronography, electromagnetic discharge imaging (EDI),* and *radiation field photography.* It is commonly called *Kirlian photography* in honor of the Russian researchers Semyon and Valentina Kirlian, who pursued and developed this method of photography for over 30 years. Although they did not discover this method of electro-photography, they devoted a lifetime to studying its potential and made claims for its use as a diagnostic tool.

Kirlian photography uses high-voltage, low-current electricity to create a corona discharge around an object. The feeble light from the corona discharge can expose film or a CCD element in a digital camera. How the corona discharge is recorded using sheet film is different than when using a digital camera. So I will describe both methods, starting with classic film exposures.

Color Film Exposure

When using color sheet film the object to be photographed is placed on top of and in direct contact with the film. When the high voltage is applied to the exposure plate, and the inanimate object is grounded, a corona discharge will emanate from the object, exposing the film in two ways. The first way, is the feeble light from the corona discharge expose's the film in a normal way that light exposes film. The second way, is that the corona discharge passes through the film. As it passes through the film it can activate the photosensitive silver in the three dye layers of the color film. Because of this dye activation, the resulting Kirlian images may contain fantastic colors that were not actually present in the corona discharge.

Figure 1.1 illustrates the basic Kirlian sheet film photography arrangement for photographing inanimate objects. The exposure plate is made out of a conductive material, typically a metal plate. The exposure plate is usually coated with a thin layer of insulating material, or dielectric, on its top surface. The sheet film lays on top of the exposure plate, emulsion (photosensitive) side up, facing the object to be photographed. The object is placed on top of the film.

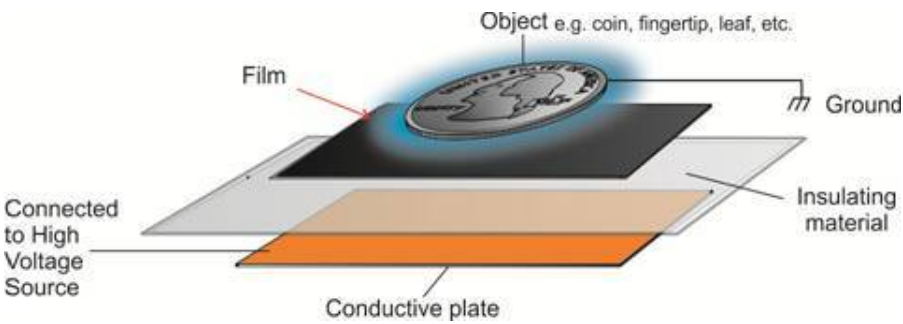

Figure 1.1 -- Overview of sheet film set-up

The procedure for shooting a Kirlian image is as follows. The high-voltage power source is connected to the exposure plate. If the object is inanimate, it is connected to an earth ground. Next the room lights are turned off, or the Kirlian photography set-up is covered in a light tight enclosure. The sheet film is loaded onto the exposure plate emulsion side up. The grounded object to be photographed is placed on top of the film. The high voltage power source is turned on, once on, a corona discharge forms around the object. The HV power is kept on for a short time, approximately 2-3 seconds to expose the film. The exact time for the exposure is determined by trial and error. After the

film is exposed and developed, the resulting picture or transparency is a Kirlian image.

This simple illustration shows how Kirlian photographs can be made without light, lens system or a camera. This is Kirlian photography at its most basic level. It is a high voltage contact print photography.

Digital Camera, iPhone or Low Lux Video Camera

This next Kirlian photography set up, see Figure 1.2, may be used with the following types of cameras; digital, 35mm film, iPhone or a low lux video camera. I am illustrating the set up with a digital camera but the other cameras will work as well. The specifications for the various cameras are provided in Chapter 4.

Using a digital camera requires the use of a flat transparent discharge plate (TDP). The TDP itself is constructed using a glass plate with a transparent, but electrically conductive coating on one side of the glass. The transmission of light through the TDP is usually better than 90%.

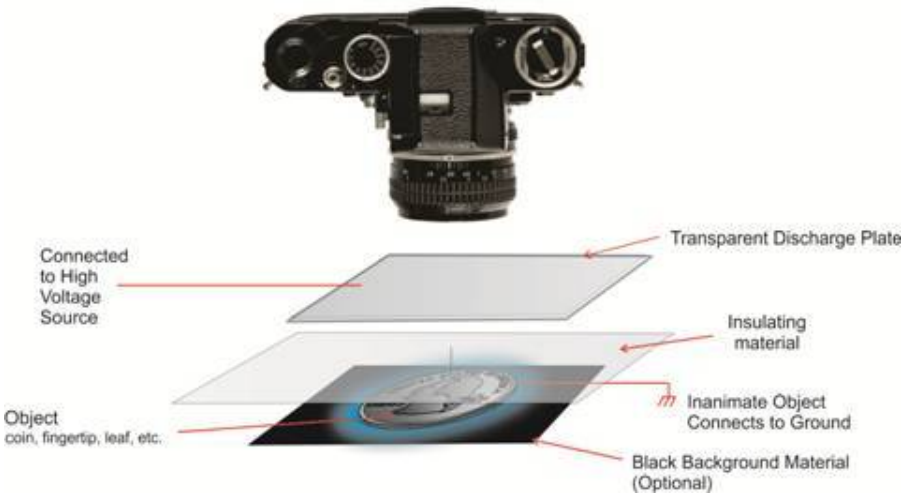

Figure 1.2 -- Overview of Digital photography set-up

The subject or object being photographed is in direct contact with the TDP. The high-voltage power source is connected to the TDP. If the object being photographed is inanimate, it is connected to an earth ground. The digital camera is manually focused onto the object through the TDP. The room lights are turned off, or the Kirlian photography set-up is covered in a light tight enclosure. Next, the high voltage power source is turned on, once on, the feeble light from the corona discharge should be visible around the object, through the TDP. Next the digital camera shutter is tripped to make a timed exposure of 10-15 seconds. When the camera's shutter closes, the high voltage power source is turned off. The digital camera should have recorded the corona discharge around the object which is a Kirlian

image.

Directions in Art and Science

There are two directions that one can take when pursuing Kirlian photography; art and science. Art uses Kirlian photography for special effects. Science investigates the potential of this method of photography for its scientific or medical value.

Art & Aesthetics in Pictures

Using the Kirlian technique for special effects photography is easier than pursuing it for its scientific value. Many parameters that must be controlled and recorded for research are ignored when shooting for special effects. Aesthetically, the Kirlian technique can be used to create interesting high voltage images of common objects. This book shows you how to build the equipment and the techniques to create a large variety of Kirlian images.

Scientific Inquiry

There was a flurry of research on Kirlian photography in the early 1970s. However, most of this experimentation was not by scientists, nor did the experimenters hold the numerous variables under controlled laboratory conditions. This invalidated the work and the speculative conclusions drawn from the work. In order for science to accept new data, the research and its results must be repeatable. This is accomplished by using the scientific method with measured and controlled parameters. When scientists tried to reproduce the reported results, they could not.

Pursuing Kirlian photography for its potential scientific value is a harder road to travel. Any reports, of human bio-plasma fields and Kirlian auras that foretell illnesses will be met with a fair amount of skepticism from the scientific community. So, if you pursue scientific research, it's important to control every variable over every experiment and keep scrupulous records of controls and results.

We will not be pursuing Kirlian photography for its scientific value in this book.

Photography variables

For the most part, as photographers we don't need to employ strict laboratory controls. However, we still want to produce and reproduce the best images possible. Photographers learn that the patterns and "aura" of electro-photographs are predominately determined by

conductivity of the object, pressure on the plate, air spacing between the object and the plate, and the length of exposure time.

Color in Kirlian Film Photographs

Many Kirlian photographs show a wide range of colors, see Figure 1.3, that includes reds, greens, blues, and white. Since the corona discharge is predominately blue-violet, where do these other colors come from?

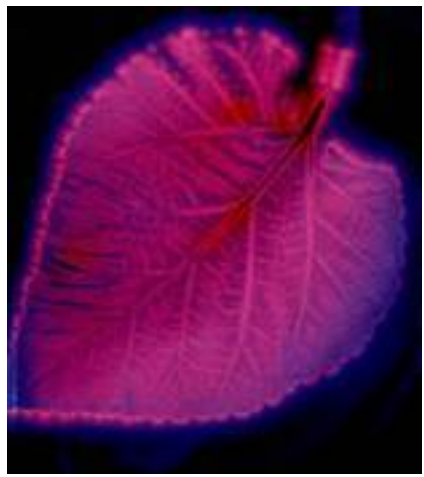

Figure 1.3 -- Kirlian image of leaf

To answer this question, you must examine the structure of color film. Color films are made with three separate silver halide dye layers. Each dye layer is designed to respond to a specific color of light: one for red, one for green, and one for blue (Figure 1.4). This arrangement works very well when exposing film to light in a standard camera. The colors in the image projected onto the film plane are accurately recorded in the film dye layers.

Figure 1.4 -- Structure of color film

With Kirlian photography, the high voltage corona discharge generates its own light by photo ionization of the air. Since air is predominately nitrogen gas, the generated light contains a high percentage of UV light. In the Kirlian set up, the film is sandwiched between the object on the front of the film and the exposure plate on the back of the film. Air gaps may occur from too much pressure or uneven pressure between the object, film and exposure plate. These air gaps is where photo ionization occurs. If you think about this, you will realize the sheet film can be exposed from its back as well as the front. In addition, the corona discharge travels through the film layers where it can activate the photosensitive silver halide crystals in the dye layers. These factors contribute to create color in the resulting Kirlian images that do not exist in the color of the corona discharge.

Color in Kirlian Digital Images

Digital cameras as well as other cameras that use the transparent discharge plate, such as the iPhone, video and film cameras, usually capture the true blue-violet color of the corona discharge. However, the color of the corona discharge in these digital images may be changed, manipulated, and enhanced using photo editing programs like Adobe Photoshop (Figure 1.6). Photo editing software may also be used to reduce and remove noise in the digital images. Noise typically accumulates during the long exposure times needed to capture the faint glow of the corona discharge. Removing noise from digital images is shown in Chapter 6.

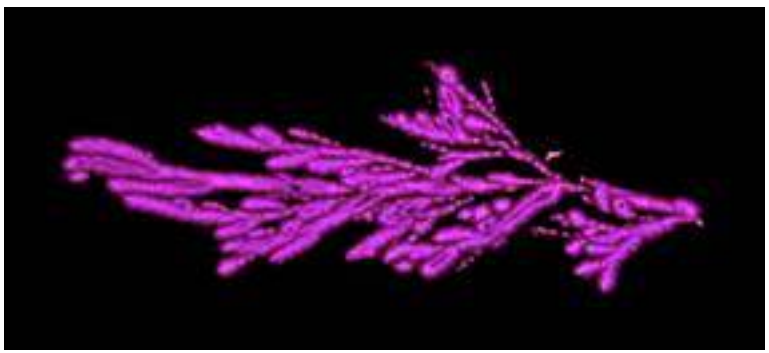

Figure 1.6 -- Kirlian images manipulated in Photoshop

Making Digital Kirlian Images

There are three main components you need to begin shooting digital Kirlian images, as well as a proper area or enclosure in which to shoot.

A proper area is one where you can turn off the lights and achieve relative darkness. If a proper area is not available to you, you can instead, make a basic light tight enclosure, as detailed in Chapter 5, for the Kirlian photography set-up. In each case darkness is the main requirement for shooting Kirlian images because it allows the camera to capture the feeble light from the corona discharge. If you tried to shoot a Kirlian image with standard room illumination, the room's light would overpower the feeble light from the corona discharge and wash it out of the image.

The three main components that are required are:

- **High Voltage, low current power supply**
- **Transparent Discharge Plate (TDP)**
- **Suitable Digital Camera**

You may buy or build a high voltage power supply and transparent discharge plate. In the next two Chapters I will show you where you may purchase as well as how to build both. In Chapter 4, I will go over the minimum requirements for your digital camera(s). The following chapters are on shooting Kirlian photographs and photo-editing the images for cleaning up noise and color manipulation.

Chapter 2

High Voltage Power Supplies

To create Kirlian images you need a high voltage (HV) power supply. You want a power supply that outputs continuously, rather than one that outputs single pulses. The output voltage ought to be about 3000 to 10,000 volts. However, the output current must be low, 1 milliampere or less. I keep the current output low to keep the high voltage power supply relatively safe. I point this out because I have seen experimenters using what I consider unsafe high voltage high current power supplies, like neon sign transformers. I would never recommend using a neon sign transformer to create Kirlian images.

What makes a high voltage power supply safe? Keep in mind that "Safe" is a relative term; all high voltage power supplies are potentially dangerous and will give a shock if used incorrectly. What I personally consider a safe power supply is one whose output current is 1 milliampere (1mA.) or less. I consider this low current to be non-lethal. And yes if you're interested, I have shocked myself many times when creating Kirlian photographs with my low current high voltage power supply, while not pleasant, it's obviously non lethal. Voltage doesn't kill, current does.

The trade off in using a low current power supply is the size of the object you can expect to use to create a Kirlian photograph. There is no hard and fast rule as to the size you can photograph with a low current high voltage power supply, but from my experience you can expect to image an object with a 3" x 3" surface area with little problems. Keep in mind that the object's conductivity and topology factors heavily in the surface area one can expect to create a corona discharge around and image.

Unsafe High Voltage Power Supplies

Figure 2.1 -- High voltage power supply (unsafe)

Neon Sign transformers are not safe to use when making Kirlian images, because they output high current. The output current in these transformers varies between 20 to 30 milliamperes. I consider these neon sign transformers to be lethal. DO NOT USE!

Other high voltage circuits not to use are circuits/devices made for stun guns, Tesla coils, or any high voltage circuits/device that output current greater than 1milliampere.

Safer High Voltage Power Supplies

There are a number of induction coil or Flyback transformer high voltage circuits that are low current and suitable for our application. In general, induction coil circuits are typically lower frequency devices operating around 300 to 2000 Hz. While Flyback transformer high voltage circuits typically operate at higher frequencies of 20000 Hz or more.

The first question is whether to build or buy. There are a number of companies that sell high voltage power supplies and kits. An internet search will turn them up. I will look at one kit here, see Figure 2.2. Now you do not have to purchase the kit. The schematic and parts list is provided so you can use point to point wiring on a breadboard. The kit just makes it easier to build and less chance of an error.

Important Safety Warning

This is a high voltage power supply that is intended for use by adults. Children should not build or operate this kit. This kit is not intended for children!

Assembly of this kit requires high-temperature soldering and the use of sharp edged components and cutting tools. Some included components may become hot, leak, or explode if used improperly. The author and Images SI, Inc. recommend that you wear safety glasses when building or working with any electronic equipment.

High voltage discharges and shocks can cause injury and/or death. Additionally high voltage electricity as generated by this assembled kit can cause damage to property. The author and Images SI, Inc. disclaim any liability for damage or injury caused by the use or misuse of the High Voltage Power Supply Kit. By building this circuit or kit, you agree not to hold the author or Images SI, Inc. liable for any injury or damage related to the use, misuse or to the performance of this product. This product is not designed for, and should not be used in, applications where the malfunction of the product could cause injury or damage.

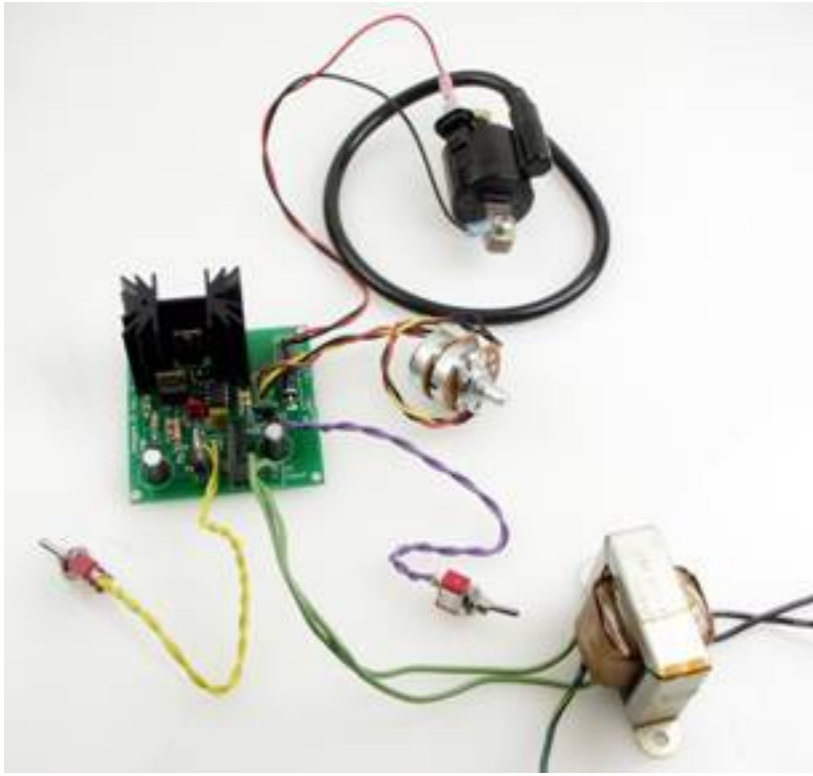

Figure 2.2 -- High Voltage Power Supply by Images SI, Inc.

Features:

This high voltage power supply has a variable frequency control. Using this control you can change the frequency of the high voltage. In addition it has a toggle switch that will select a High or Low frequency range. The circuit can be either powered by batteries that supply 9-12 volts. Or a wall transformer with an output of 9-12 Volts. The output from the wall transformer may be either an AC or DC. Powering the unit from batteries allows the the advantage of portability for fieldwork.

How the Circuit Works

The circuit schematic for the high voltage power supply is shown in the Figure 2.3. This device is based on the 555 timer. The 555 Timer is set up in astable mode (free running oscillator). The pulse output signal from the 555 Timer, pin 3, is fed to the base of Q3, a 3055 NPN transistor. The collector of transistor Q3 is fed to the base of a high voltage transistor Q1 that turns the transistor on and off. Transistor Q1, pulses the current flowing through the induction coil T1 generating the high voltage output.

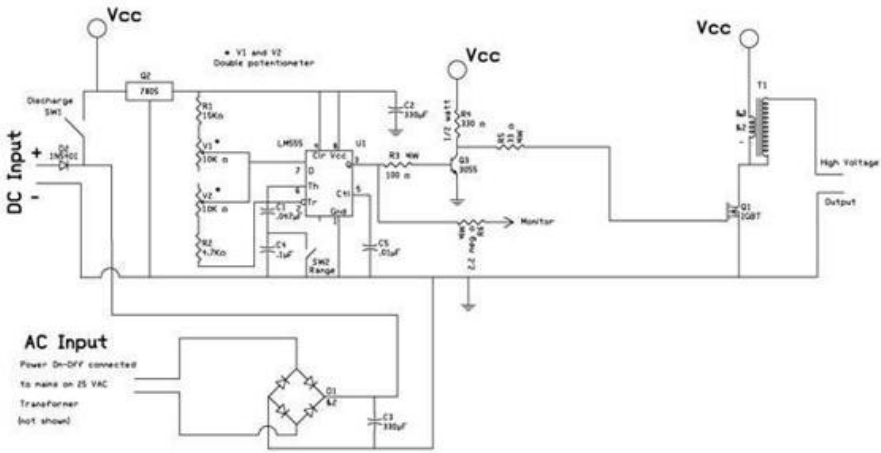

Figure 2.3 -- Schematic for high voltage power supply

The hi-low frequency range switch allows capacitor C4 to be added or subtracted from the main timing capacitor C1.The variable frequency of the 555 timer is controlled by the double-ganged potentiometer, shown as V1 and V2 in the schematic. A double-ganged potentiometer means that it is really two potentiometers that share a common shaft. A close up of the double ganged potentiometer is shown in Figure 2.7. The center terminal of the potentiometer is called the wiper. The two wipers of the double ganged potentiometers are soldered together and connected to pin 7 of the 555 Timer. All the current to energize the T1 ignition coil passes through transistor Q1. To prevent Q1 from overheating, a large heat sink is attached.

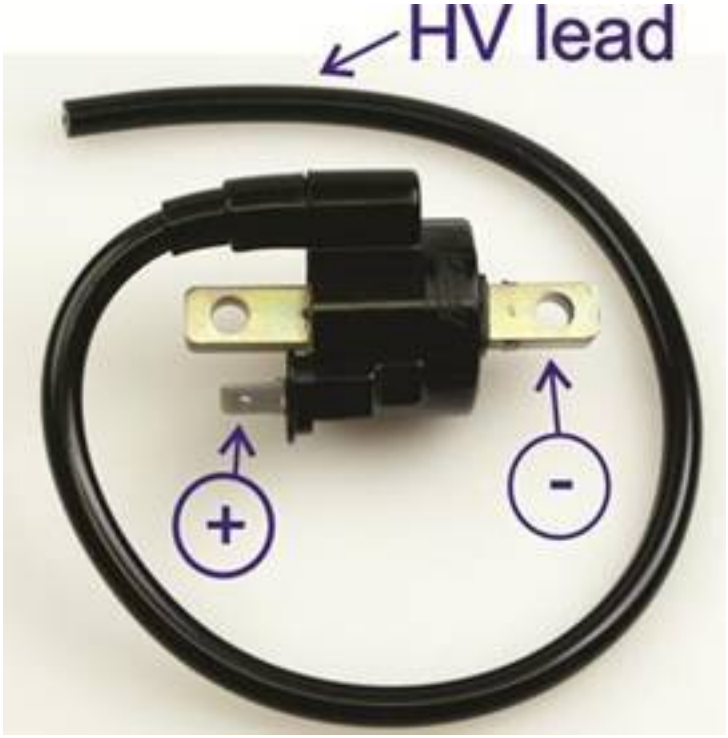

Figure 2.4 – High Voltage Ignition coil

The transformer T1 is our high voltage induction coil. This type of transformer can also be called; a high voltage autotransformer, an ignition coil or an induction coil. I have used these names interchangeably throughout the text. The T1 ignition coil is a three terminal device. Figure 2.4 shows where we connect power from our circuit to the coil. The coil has a thick high voltage black wire coming out of a molded plastic protuberance. That wire is the high voltage output of the transformer. I especially like this autotransformer because of its well-insulated (HV) wire is molded to this protuberance. Wires from the solder connections on the PC board labeled HV coil (+) and (–) are used to connect T1 to PCB.

Construction of High Voltage Power Supply

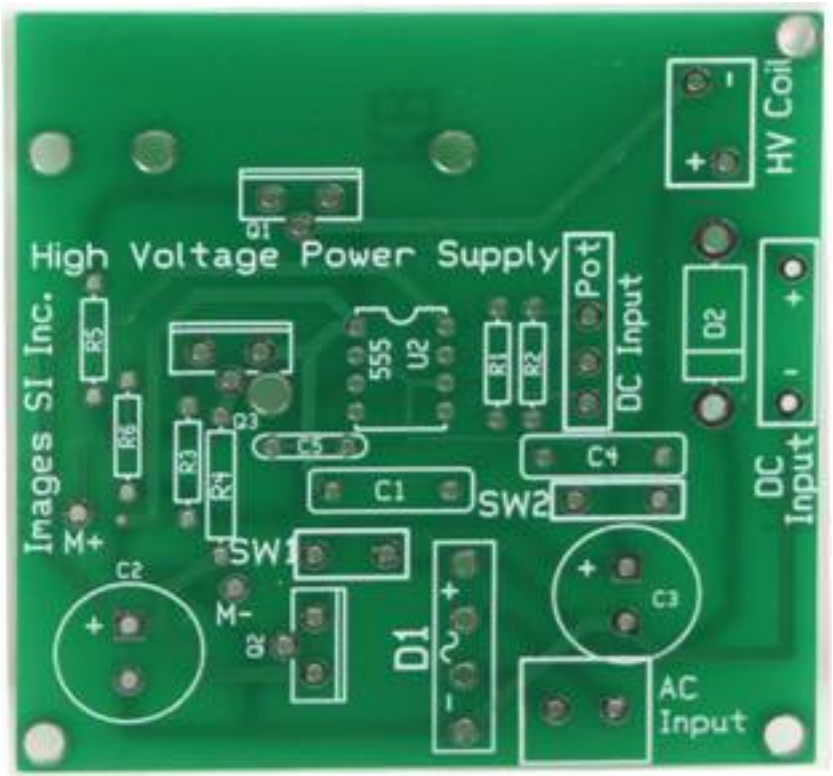

Figure 2.5 -- PCB

The top side of the Printed Circuit Board (PCB) has white silk screen component outlines. The components are mounted on the top side of the PC board. The leads of the components pass through the pc board and are soldered on the bottom of the PCB. After soldering, cut off any excess wire from the bottom of the PCB.

Start construction by mounting and soldering the 8-pin socket. Insert the IC socket on the component side, making sure to orientate the notch on the socket to the notch on the outline drawing of the socket on the PCB. Solder the 8-pin socket leads on the bottom of the PCB.

Figure 2.6 -- Construction of PCB

Next mount and solder Q2, the 7805 voltage regulator, and Q3, the 3055 transistor. Mount and solder R1, the 15K resistor (color bands brown, green, orange) and R2, the 4.7K resistor (color bands yellow, violet and red). R3, the 100 ohm resistor (color bands brown, black, brown), R4, the 330 ohm 1/2 watt resistor (color bands orange, orange, brown), and R5, the 33 ohm resistor (color bands orange, orange, black) should now be mounted and soldered. Next mount and solder the bridge rectifier D1, making sure to orientated the + pin of the rectifier to the + sign on D1's silk screen outline. Now, mount and solder capacitors C2 and C3, 330uF capacitors. Orientate the (+) leads on the capacitors to the + leads on the silk screen outline. Next mount and solder D2, the 1N5401 diode. The band across D2 should be orientated to match the band on D2's silk screen outline. Next mount and solder and C5, the .01uF capacitor. This capacitor does not have polarity, a + or - lead, and therefore can be mounted to the PCB either way.

Figure 2.7 -- Double ganged potentiometer

Wire the double ganged potentiometer as shown in Figure 2.7. Next, solder the opposite ends of the potentiometer wires to the printed circuit board, in the box labeled “POT”. The center wire of the potentiometer is soldered into the center pad on the labeled box. The two end wires are soldered into the pads on either side of the center position.

Mount the Q1 transistor to the black aluminum heat sink using the machine screw, washer and nut provided. Next, mount the heat sink and transistor to the Q1 position on the PC board. The bottom of the heat sink should be flush with the top of the PCB. The leads of Q1 should pass through the Q1 pads on the PCB. With everything orientated properly, the heat sink's two feet are in the two holes on the PC board. On the bottom of the PCB, solder the heat sink feet in the holes to make a mechanically strong bond. Solder the three leads of Q1 to the appropriate Q1 pads on the PCB. After soldering trim the excess wire from Q1.

Attach 6 inch wires to both switches SW1 and SW2. Solder the opposite ends of the switch wires into the pads marked for SW1 and SW2 on the pc board respectively. Switch SW1 controls power to the circuit. Switch SW2 is the frequency range high-low control. Mount and solder capacitors C1 (.047uF), C4 (.1uF) to the PC board. Solder

two 10” lengths of wire to the HV coil pads on the PC board. Attach the crimp terminals to the opposite ends on these wires. The quick disconnect terminal attaches to the (+) wire; the ring terminal to the (-). Attach these terminals to the HV coil as shown in Figure 2.8. Making sure to place the (+) lead to the (+) terminal on the HV coil.

Attach the 12 volt power leads to either the AC input or DC input pads on the PC board.

Next install the 555 timer, which is the 8-pin integrated circuit. Before installing an integrated circuit (IC) chip, first identify the top of the IC chip. The top of the chip has a marker, many times it is a half circle cutout in the IC body. Sometimes it is a small mark identifying pin 1 on the IC. In both cases, these marks identify the top of the IC chip. Orientate the top of the IC chip with the notch in white silk screen outline and/or the notch in the IC socket, then install the IC into its socket.

The leads on the PC board labeled M+ and M– are not used.

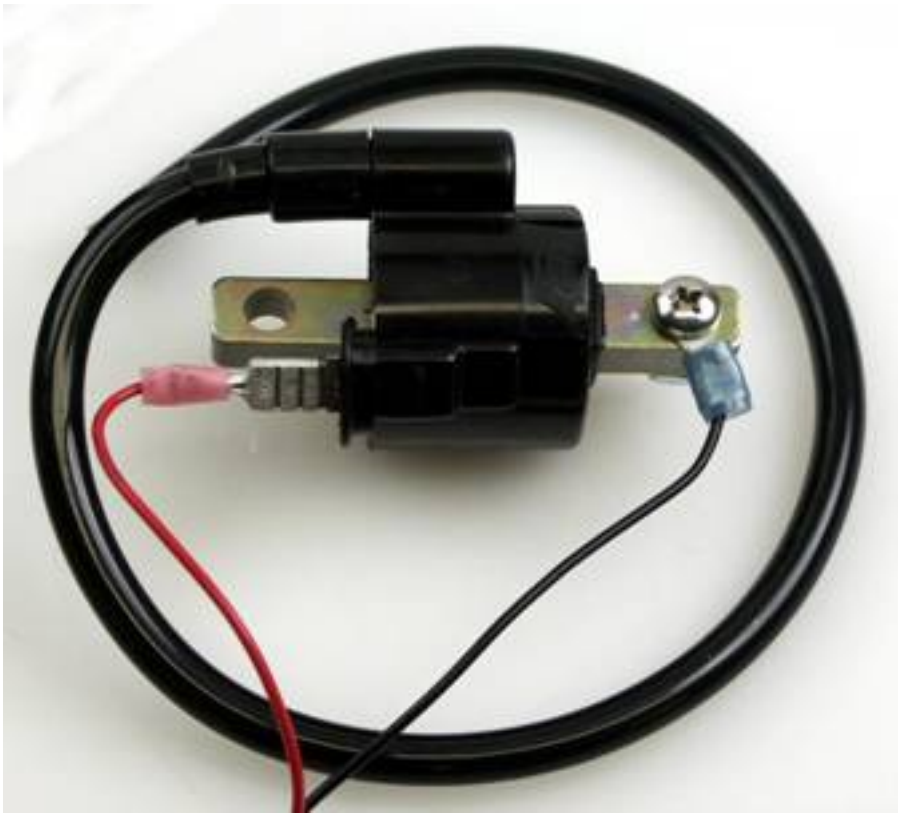

Figure 2.8 Ignition Coil Wired

Testing & Finishing Construction

To test the circuit, take the open end of the HV wire and place it about 1/4 inch away from the (-) negative terminal on the ignition coil. Apply power to the circuit. An electrical discharge should jump across the gap, between the HV wire and the negative terminal of the ignition coil. Adjust the potentiometer (frequency control) to obtain the largest spark across the gap.

If you do not get a continuous spark across the gap, you have a board error. Go back to your pc board and start checking your components and soldering.

The working circuit should be mounted inside a plastic enclosure. Coat any exposed wires with a plastic spray to provide insulation. No-Arc spray or Corona dope are insulating material coatings. In a pinch you can use clear nail polish. Since nail polish is flammable when wet, allow the nail polish to completely dry before using the circuit.

Frequency & Voltage Output

Using the standard C1 and C4 capacitors the low frequency range is approximately 600-1300 Hz. The high frequency range is approximately 800-2000 Hz. By changing capacitors C1 and C4, one can vary the operating frequency and output voltage of the circuit, see chart below.

HV TRANSFORMER IN AIR INPUT VOLTAGE 12 VDC

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HVPS-01 Parts List

PCB-36
Heatsink-03
C1 .47 uF, 100V capacitor
C2, C3 .33uF, 16V capacitors
C4 .1uF, 100V capacitor
C5 .01 uF, 100V capacitor
Q1 HV Transistor IRF830 or Equivalent
Q2 7805 Voltage Regulator
Q3 2N3055 NPN Transistor T0220
U1 LM555 Timer
8 pin socket
T1 HV transformer (HVT-09)
R1 15K 1/4 watt resistor
R2 4.7 K 1/4 watt resistor
R3 100 ohm 1/4 watt resistor
R4 240 ohm 1/2 watt resistor
R5 33 ohm 1/4 watt resistor
R6 2.2 Mega ohm 1/4 watt resistor
D1 Bridge rectifier (BR-4A-100)
D2 1N5401 diode
SW1, SW2 Toggle switches(SW18)
POT Double ganged 10K potentiometer
(1) Screw 540x3/8 PH Z
(1) Nut 540x5/16 SS
(1) Ring Terminal (blue)-Terminal-34161
(1) 1/4" Quick Disconnect Terminal (red)
(1) Screw 1024x5/8-PH
(1) Nut 1024x3/8Z
(1) Lockwasher-LW-10

Enclosure

If you made it this far, you have completed the high voltage circuit and tested it. You can use the circuit as is, but it is a better idea to enclose the circuit inside a plastic case. I recommend a plastic case and not a metal case. A plastic case will help eliminate shorts and shocks.

The size of the plastic case I used is 6”x 6” x 3.25” deep, see Figure 2.9. But any size case large enough to hold the circuit board and controls may be used. I created a decal for the top of the 6 inch by 6 inch enclosure that you can download and print for free from the Imagesco website.

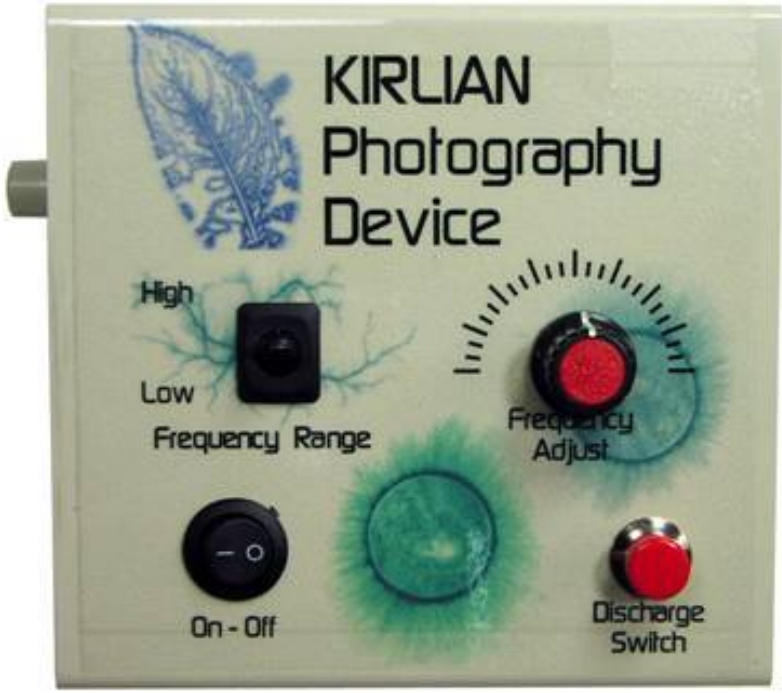


Figure 2.9 -- Top View of Kirlian Enclosure

I improved the standard circuit by adding an On-Off power switch that controls power to the unit. I upgraded the Discharge switch from a ON-OFF toggle switch and made it a Normally Open (OFF) momentary contact switch. To activate the high voltage power supply the On-Off power switch must be in the On position and the Discharge switch must be pressed.

Using a momentary contact switch has two advantages. One it makes it easier to time exposures. Second, if you shock yourself the natural tendency is to pull your hand away, which would release the momentary contact switch putting it in its off position.

Figure 2.10 -- Internal View

The photograph above, see Figure 2.10, shows how I placed the circuit board, HV transformer and other components inside the plastic enclosure. Notice that the 12V power transformer is not mounted inside the enclosure. Instead of a standard transformer I decided to use a 12 volt wall transformer. The transformer I used had a 2.5mm power plug. So I purchased and mounted a 2.5mm panel mounted power socket on the wall of the enclosure. The wires from that socket connects the external power from the wall transformer to the circuit board through an ON-OFF switch.

I mounted the four circuit board controls; on-off switch, discharge switch, frequency range switch and frequency control, on the top of the enclosure.

Handling high voltage is always a concern. So to make connecting to the high voltage power supply safer, I decided to use connectors specifically manufactured for high voltage, see Figure 2.11 below.

HV Connectors

Figure 2.11, below are high voltage connectors, a socket and a plug.

Figure 2.11 -- High voltage connectors

I connected the high voltage output from the power supply to a HV socket mounted on the wall of the plastic enclosure. I used non-conductive plastic screws and nuts to mount the HV socket to the enclosure. The reason to use plastic screws and nuts was to remove a conductive path where the HV power could spark and jump to. See Figure 2.12 below. After I attached the HV wire to the socket, I coated the metal screw and nut of the socket with hot glue as an added measure of insulation and to prevent the nut from getting loose.

Figure 2.12 -- Mounting connector inside enclosure

From the outside of the enclosure, the connector socket looks like the picture in Figure 2.13.

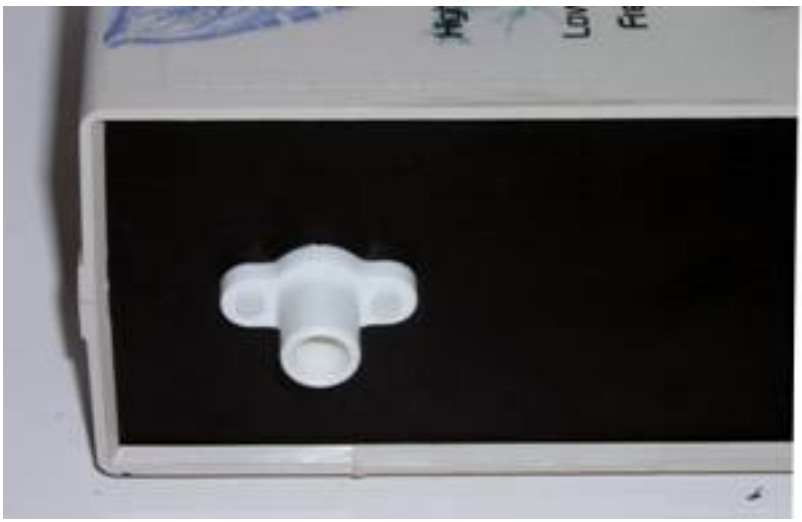


Figure 2.13 -- View of connector from outside case

To connect anything to the high voltage power supply use a high voltage plug. The high voltage wire from the Transparent Discharge Plate (TDP) is connected to a high voltage plug. This plug is plugged

into the high voltage socket to connect the TDP to the high voltage power supply.

The advantage of using high voltage sockets and plugs is that you can easily connect other accessories to the high voltage power supply. For instance, if you want to try taking Kirlian photographs using sheet film, simply disconnect the TDP and connect a Sheet Film Plate (SFP), see Figure 2.14 .

Figure 2.14 -- Transparent Discharge Plate & Sheet Film Plate

Chapter 3

Transparent Discharge Plate

The Kirlian photograph of the U.S. quarter below, see Figure 3.1, was shot with a digital camera through a transparent discharge plate (TDP).

Figure 3.1 -- Kirlian Image of Quarter

Transparent Discharge Plate - Build or Buy

Your first decision is whether you want to build or buy a Transparent Discharge Plate (TDP). To build a TDP will save you about half the cost of buying one. The retail price of a small TDP is $100.00 and building one will cost about $50.00.

Figure 3.2 Transparent Discharge Plate from Images SI, Inc.

To purchase a TDP go to: http://www.imagesco.com/kirlian/transparent_discharge_plate.html

The balance of this chapter details the construction of the Transparent Discharge Plate and a Ground Plate.

A ground plate isn't necessary to shoot Kirlian images. You can connect a ground wire to an inanimate object when it's appropriate to do so. However, a ground plate is simple to construct and will make your photography set-ups easier and improve your Kirlian images.

Construction of a Transparent Discharge Plate

A transparent discharge plate is made from four main components; a 4 inch by 5 inch piece of glass with a transparent, electrically conductive coating of tin oxide on one side, a ring electrode made from thin 1/4 inch wide adhesive copper foil tape, and two .005 inch thick pieces of transparent plastic. The transparency of our transparent discharge plate, when it is finished surpasses 90 percent.

The conductive tin oxide coating on the glass can be damaged by a high voltage discharge. To prevent this kind of damage a solid electrical connection must be made between the tin oxide coating on the glass and the high voltage power source. The solution is a ring electrode made of copper foil, taped around the outside perimeter of the glass on the tin oxide side. The copper foil tape forms a ring electrode that has a large surface contact with the tin oxide coating. This large surface area prevents a discharge spark from forming between the electrical connection and the tin oxide coating when the electrode is in use.

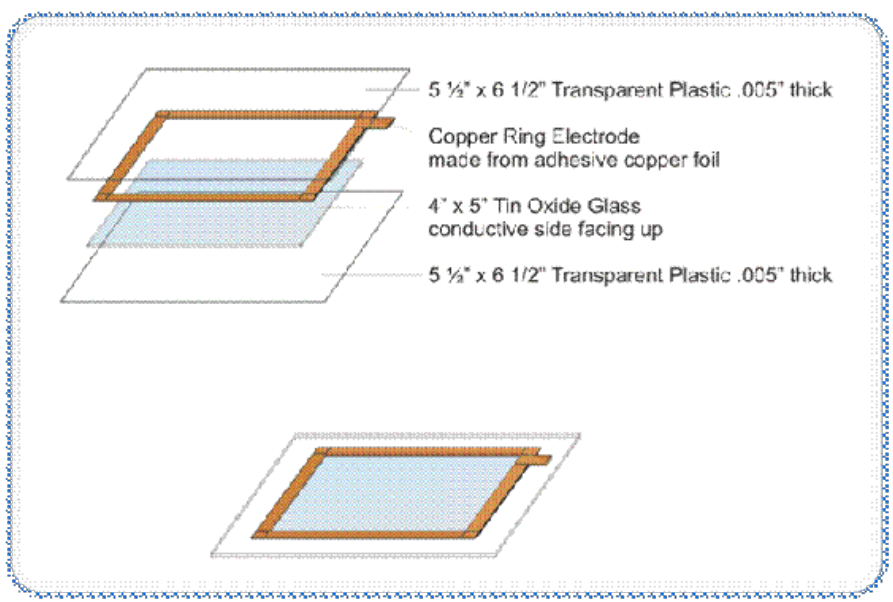

5 ½" x 6 1/2" Transparent Plastic .005" thick
Copper Ring Electrode
made from adhesive copper foil
4" x 5" Tin Oxide Glass
conductive side facing up
5 ½" x 6 1/2" Transparent Plastic .005" thick

Figure 3.3 – Overview, The Components of Transparent Electrode

The transparent discharge plate construction is shown in Figure 3.3. The two .005 inch thick pieces of transparent plastic material are cut 1 1/2 inches larger than the glass plate on each side. This makes the sheet size 5 1/2 inches by 6 1/2 inches, as shown in Figure 3.3.

When you receive the 4" by 5" tin oxide glass (Figure 3.4), be careful. The edges of the glass are sharp. Visually it will be impossible to tell which side of the glass has the conductive tin oxide coating.

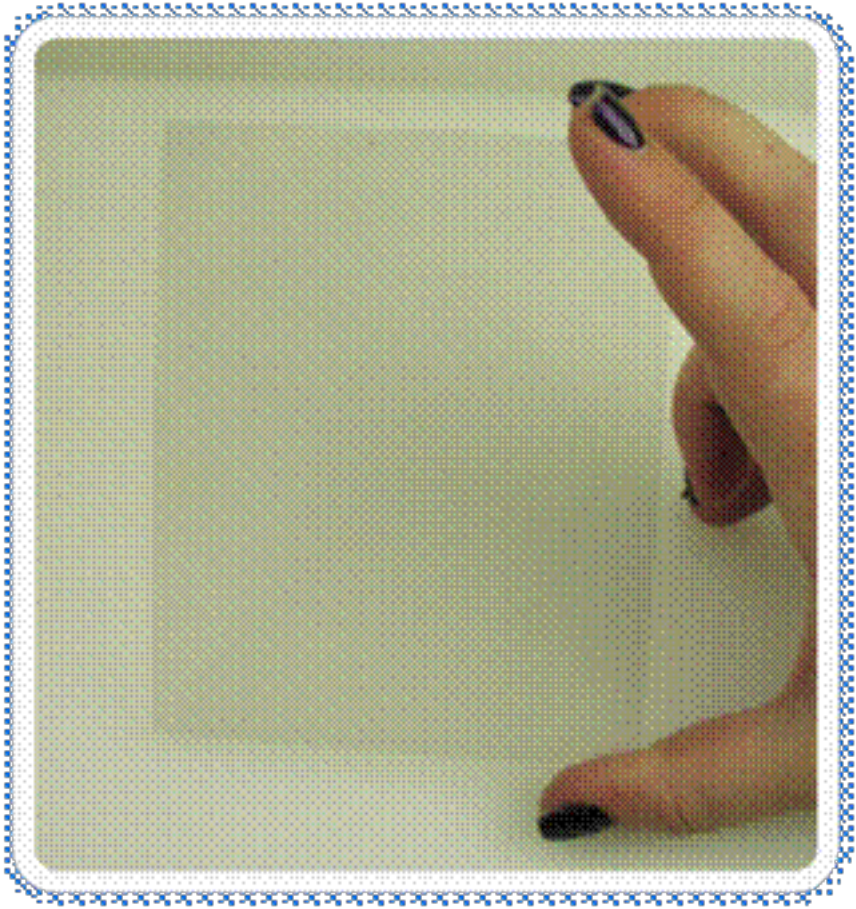


Figure 3.4 - Conductive Glass

We begin by determining which side of the glass has the tin oxide coating. To do this you need a Volt-Ohm-Meter (VOM). Inexpensive VOM's are available from local electrical stores or from Amazon.com. The following link is an inexpensive VOM that can be purchased for $10.00 on Amazon.com.

http://www.amazon.com/Volmate-Digital-Voltmeter-Ohmmeter-Multimeter/dp/B00TWTLWT8/ref=sr_1_1?ie=UTF8&qid=1464961279&sr=8-1&keywords=VOM

When you have your Volt Ohm Meter, set the meter to read OHMS on its lowest resistance setting. Bring both of the meter's probes in

contact with one side of the glass plate. The side with the tin oxide coating will deflect the meter, showing a resistance. Or if you are using a digital VOM, as shown in Figure 3.5, the resistance reading is provided numerically. The VOM in Figure 3.5 is showing a resistance of 165 ohms per inch. The other side of the glass, the side without the tin oxide coating will show an infinitely high resistance.

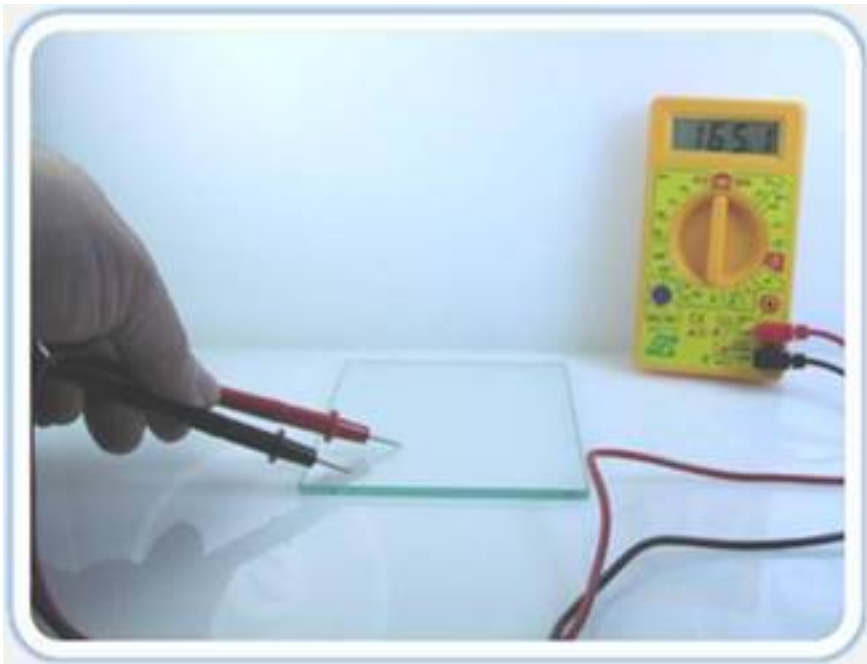


Figure 3.5 - Testing for Conductivity

The thin adhesive copper foil can be cut using scissors. Before placing the copper foil on the glass plate, clean the tin oxide side of the glass thoroughly, so the foil has a good surface to adhere to. Re-clean the glass surfaces throughout the transparent discharge plate's assembly to ensure that no prints or lint are left on the glass.

The outside dimension of the ring electrode is the same size as the glass plate. Cut two 4 inch strips and two 5 inch strips of copper foil. These strips of foil are equal to the length and width of the glass plate. Remove the adhesive backing from the foil and place foil along the edge of the conductive side of the glass, as shown in Figure 3.6. After the copper foil has been secured to the four edges of the glass, cut a one inch piece of copper foil and adhere it the lower right side of the glass's copper ring electrode. Fold any excess foil in half to create the tab, see Figure 3.7. This copper tab is where we will solder our high voltage wire make a connection.

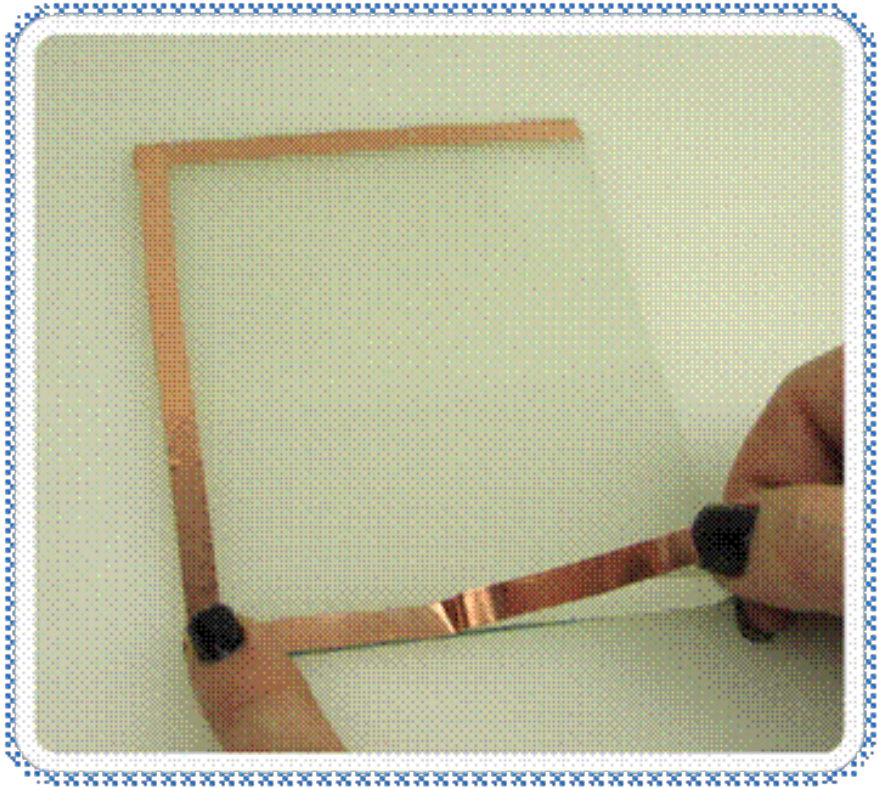


Figure 3.6 - Laying Copper Foil

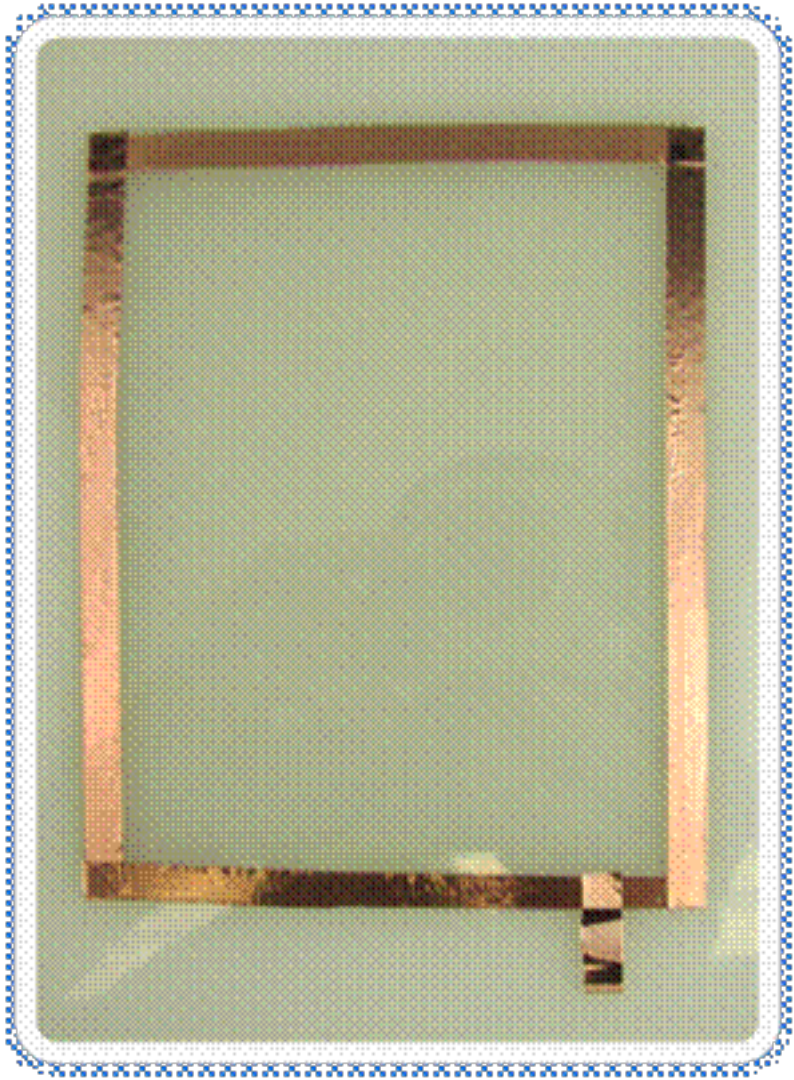


Figure 3.7 - Completed Electrode Ring with Tab

Test your assembly with an ohmmeter before proceeding. Test it by touching the tab of the ring electrode with one VOM probe and touch the glass's tin oxide coating with the other probe. Your meter should show good conductivity (low resistance). If it does great, proceed to the next step. If not Figure out what is wrong.

Next step, solder approximately 18 inches of high voltage wire to the protruding tab. The wire should lay perpendicular to the copper tab as shown in Figure 3.8. Try to solder the wire so that it lays as close to the glass as possible. This will connect the transparent discharge plate

to the HV source when you are finished.

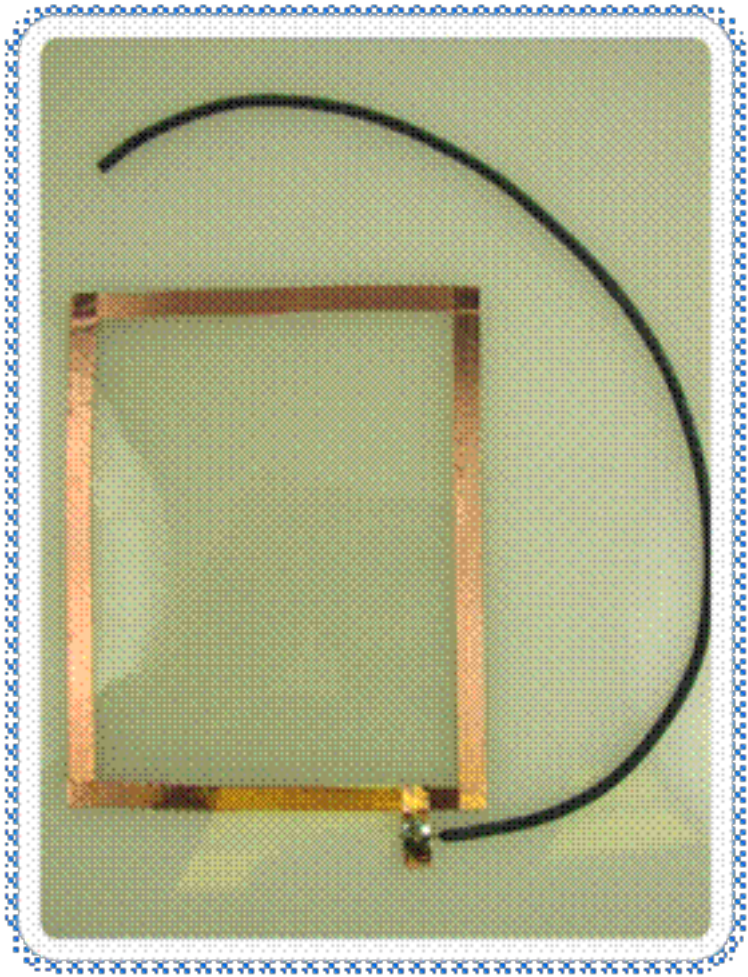
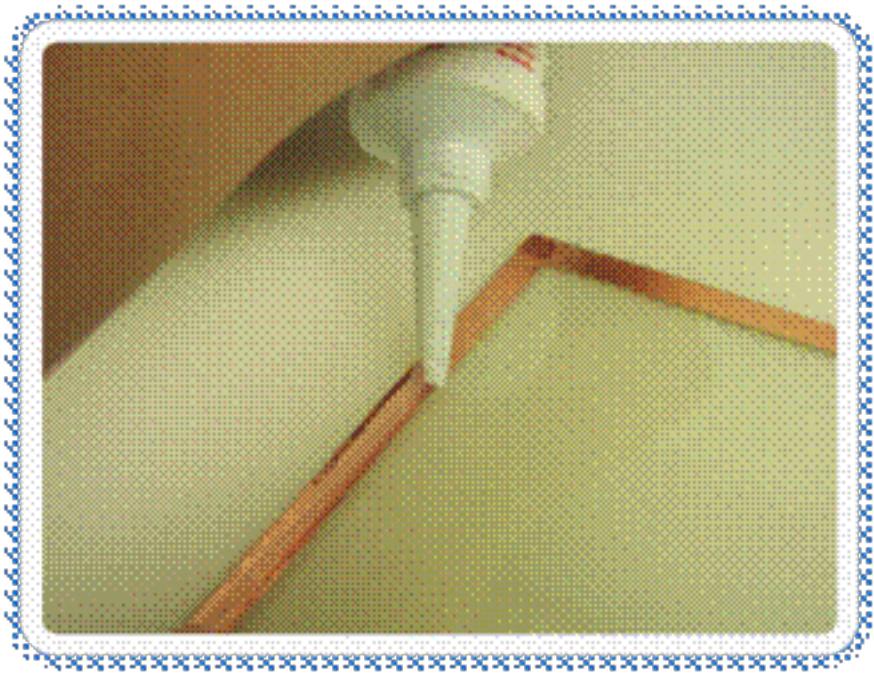


Figure 3.8 - Electrode with 18 inches of High Voltage Wire Soldered to Tab

Since the conductive tin oxide coating of the glass is delicate, we need to protect it. We use a transparent plastic sheet to accomplish this. The plastic sheet is approximately 3/4" larger than the glass plate on all sides.

Run a continuous thin bead of clear silicone adhesive around the edge of the glass plate, on top of the copper foil, as shown in Figure 3.9. Center the plastic sheet on top of the glass plate, see Figure 3.10. Then place the plastic sheet on top of the glass plate. Place a book or flat object on top of the glass and the plastic sheet to hold the assembly flat and together while the silicone cures. Curing time for the silicone

is approximately 12 - 24 hours.



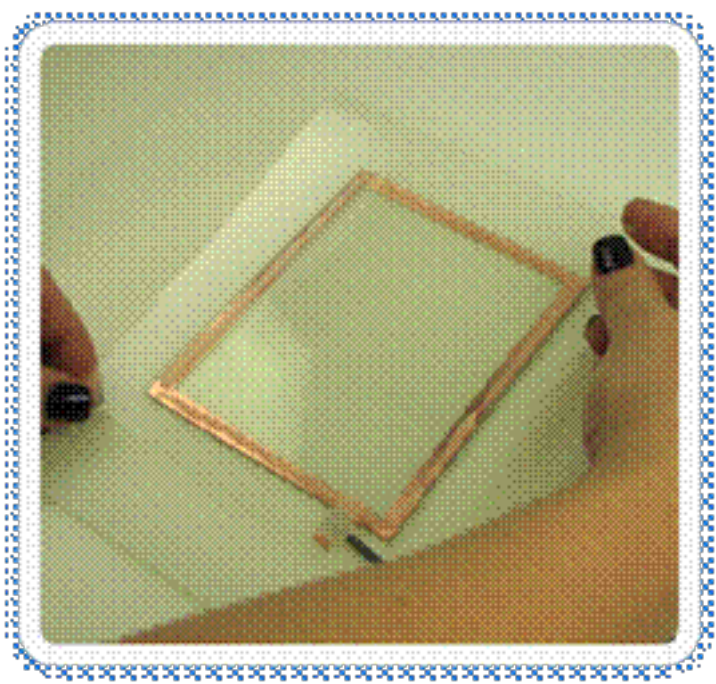
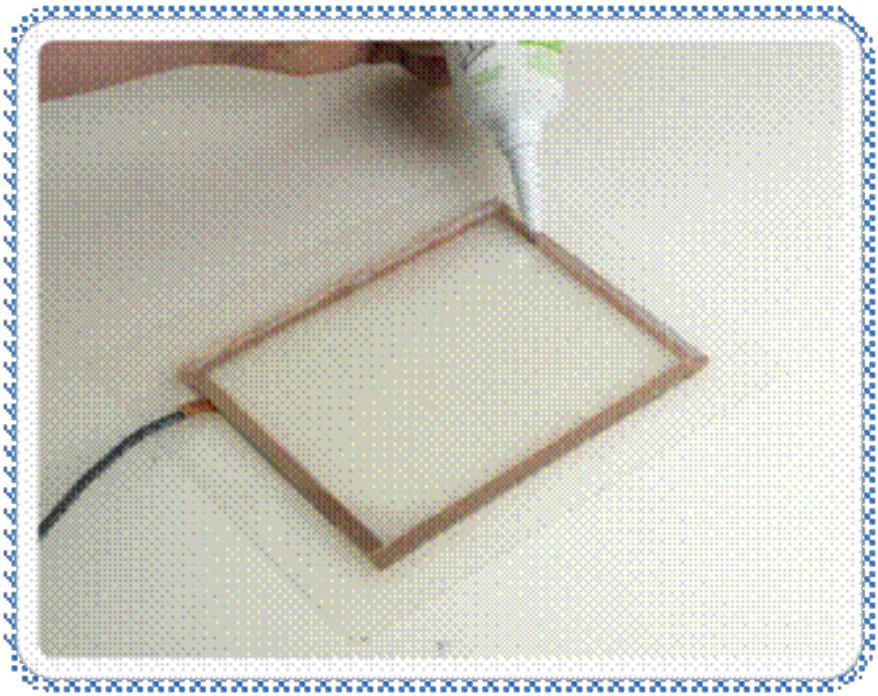


Figure 3.9 - Running Bead of Silicone

Figure 3.10 - Center Acetate

over Electrode

Once the silicone has cured, mark this side, with a small unobtrusive dot in the corner of the plastic sheet. This will identify the tin oxide side of the transparent discharge plate. Then repeat this construction process on the opposite side of glass. Run a bead of silicone around the edge of glass and center the second plastic sheet on top of the glass plate, as shown in Figures 3.11 and 3.12. Place a book or flat object onto the transparent electrode to hold the assembly together while the silicone cures. Wait another 12 -24 hours.



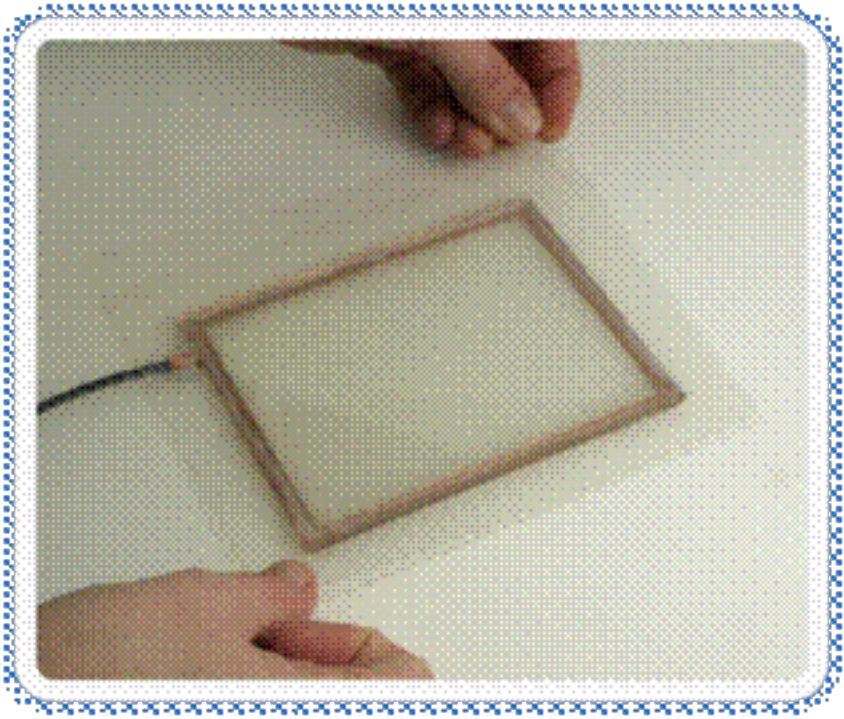


Figure 3.11 - Run Bead of Silicone on Glass Side *Figure 3.12 - Center Second Sheet of Acetate*

You should now have the glass plate sandwiched between two sheets of transparent plastic. Next, fill the gap from the edge of the glass to the outside edge of the plastic sheets with silicone adhesive, see Figure 3.13. Place a book or flat object onto the transparent electrode once again to hold the assembly together while the silicone cures. Allow to silicon to cure completely before continuing.

Figure 3.13 - Fill Gap Between Acetate Sheets with Silicone

Figure 3.14 - Electrode Sealed in Silicone and Acetate

Finish the edges of the transparent electrode by running black electrical tape along the edges of the transparent electrode. The tape will prevent the edges of the plastic sheets from catching on to anything, and it further secures the plastic sheets together (see Figure 3.15).

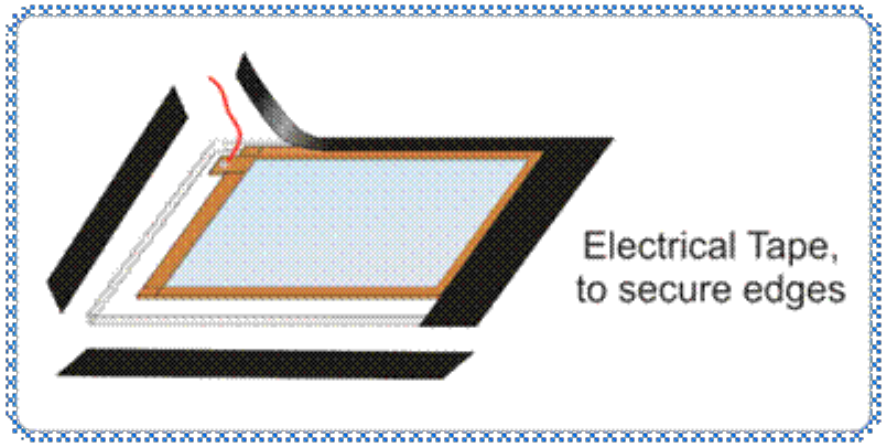
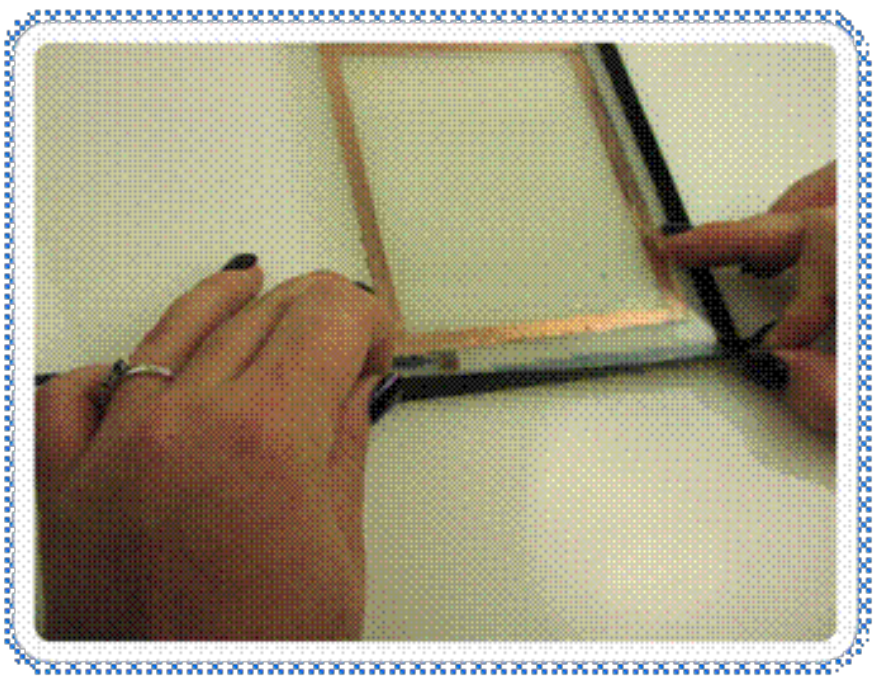


Figure 3.15 - Framing Electrode

Here is the procedure we use to attach the black electrical tape. You need an Exacto knife. First, run the tape along the edges of the transparent electrode. The tape is positioned so that you can wrap the tape around the edge of the assembly to cover the edge. When you reach the edge that has the HV wire protruding from the side, use an Exacto knife to cut a slice in the tape, so that the tape can be secured to electrode without leaving a gap. This is illustrated in Figures 3.16 - 3.19.



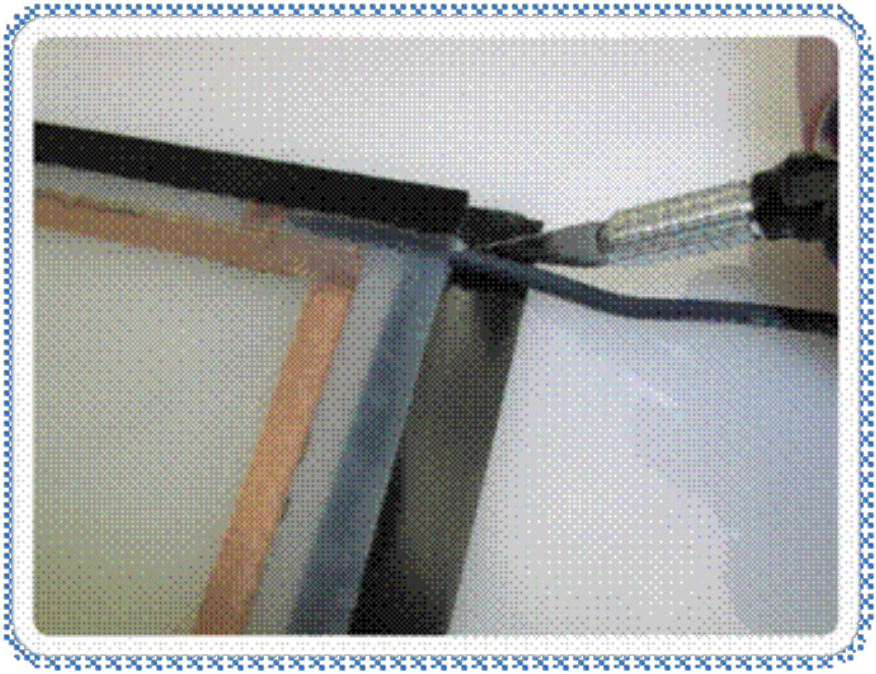
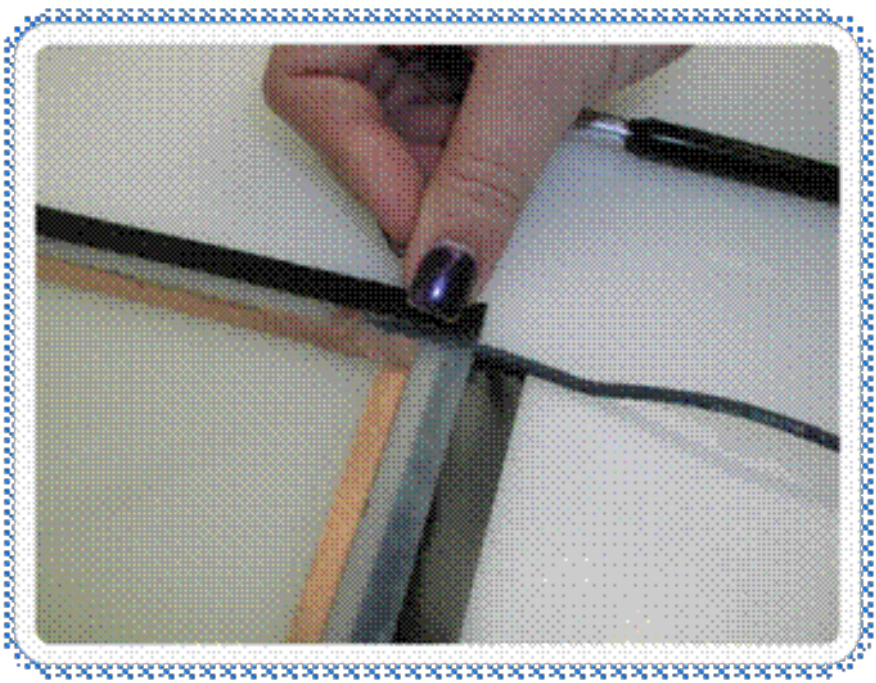


Figure 3.16 - Taping Edges of Electrode

Figure 3.17 - Cut Slit for Wire



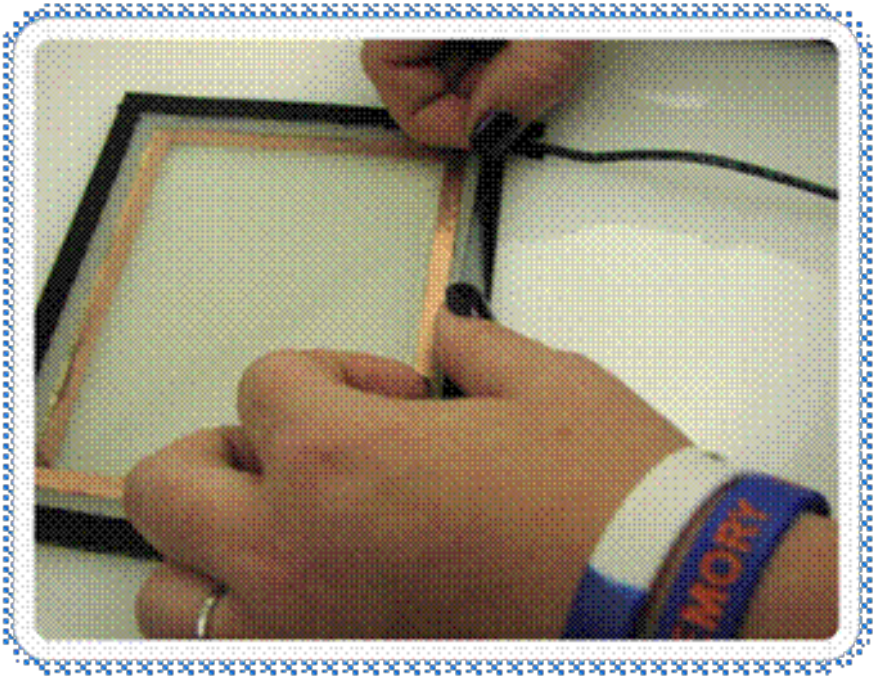
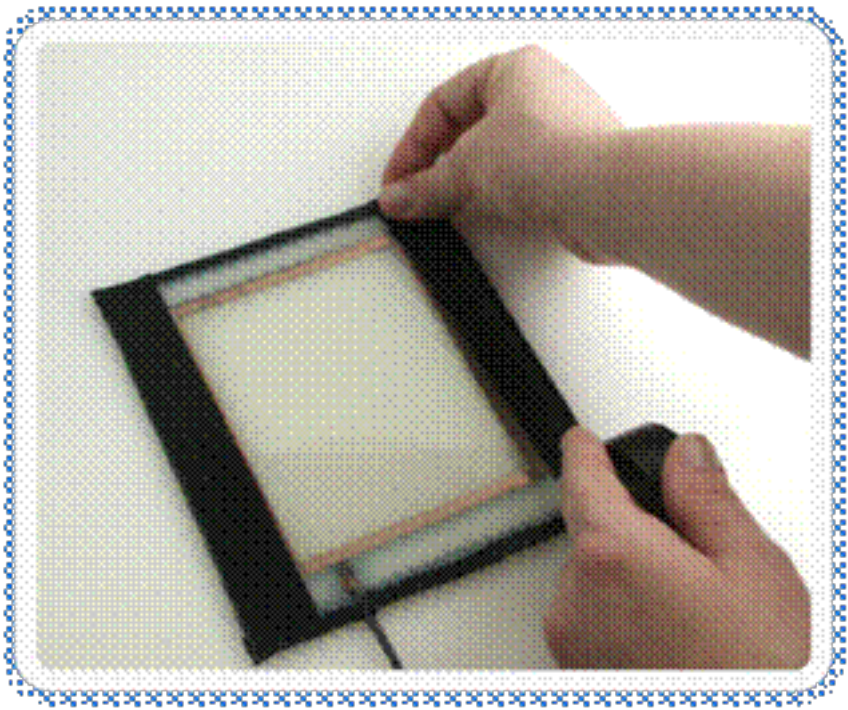


Figure 3.18 - Fold up Small Piece of Tape *Figure 319 - Finish Taping Along Edge*

Next, take black electrical tape and cover the edges of the electrical tape that is already on the assembly covering the edges. Cover all tape edges on both sides of the glass as shown in Figures 3.20 and 3.21.



Figures 3.20 & 3.21 - Wrap Tape Around Glass to Cover from Edge to Copper

The black electrical tape serves multiple purposes. First, it helps secure and protects the plastic sheets to the glass assembly. Secondly, it provides insulation along the edge of the electrode where it is needed. You may want to double the black electrical tape on the edges to provide an additional measure of insulation.

Figure 3.22 - Finished 4" x 5" Transparent Discharge Plate Ready for Use

Parts List

- Tin Oxide Coated (1 side only) Glass 4” x 5”
- ¼” wide copper adhesive tape. Approximately 24” in length
- Clear silicone caulking/glue
- (2) 5-1/2” x 7” clear transparent plastic 0.050 thick
- Length of HV wire (8-10Kev) approximately 18”
- Black electrical tape

Components and Transparent Discharge Kit available from Images SI, Inc.

http://www.imagesco.com/kirlian/kirlian-components.html

Ground Plate

Being able to easily ground an object you want to create a Kirlian image of, and doing so safely and quickly is essential for good photography. To this end, I recommend making a few ground plates to facilitate your Kirlian image making.

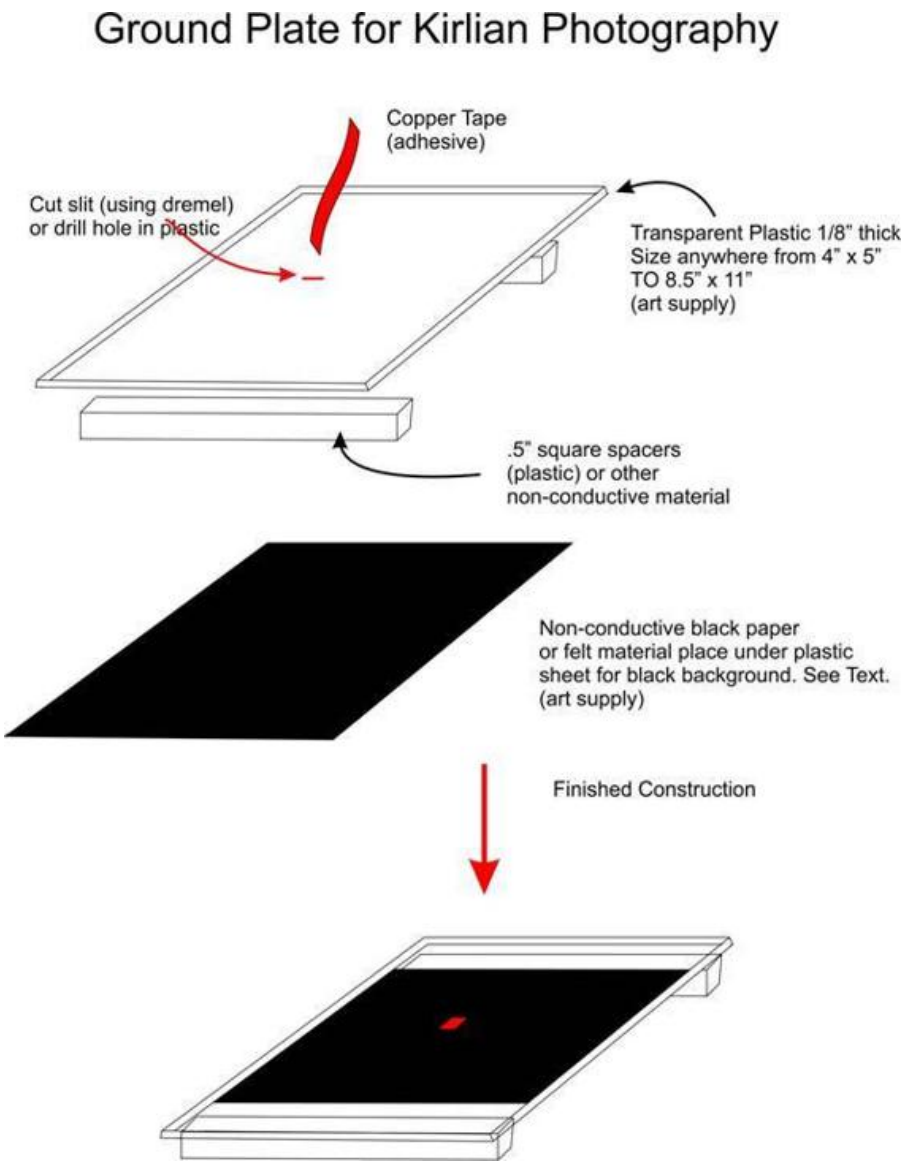


Figure 3.23 –Overview of Ground Plate

This ground plate is made from a small piece of transparent plastic 4”

by 5” and 1/8 inch thick, a few inches of copper tape, the same tape used to make the Transparent Discharge Plate, and a few short lengths of plastic that can be used as legs. I used two pieces of 1/2” square plastic about 3” long.

The size of the plastic sheet is not important, it should fit under your camera copy stand, see Chapter 4. For this example I am using a piece of plastic that is about 4” by 5”. Although any size up to 8” by 10” will also work. A piece of black non conductive paper or black felt. Tape or glued the black paper, onto the bottom of the plastic sheet. The black paper creates a black background that provides a good contrast to the corona discharge. This contrast improves the resulting Kirlian images.

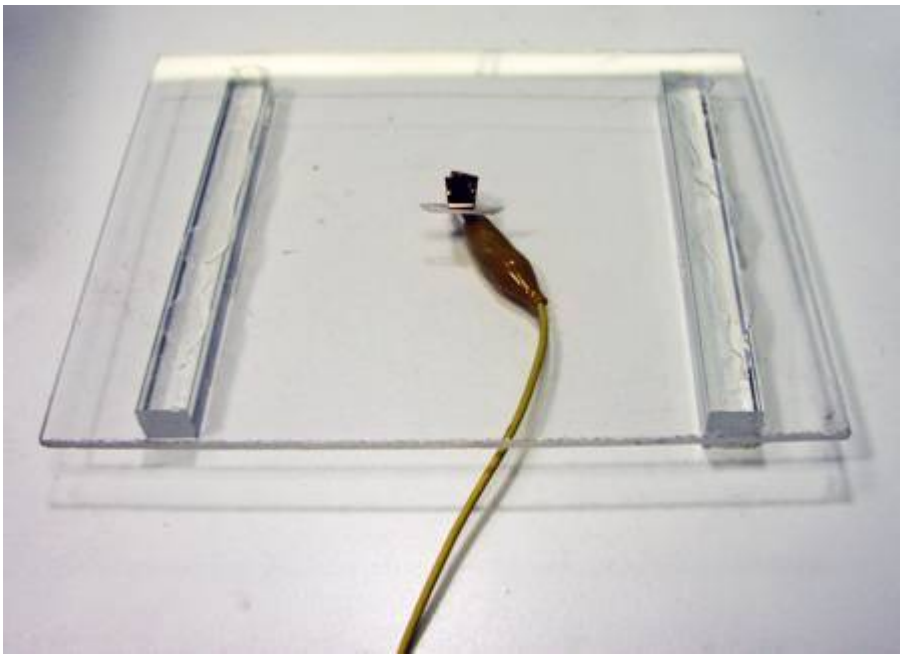


Figure 3.24 –Ground Plate Components

Figure 3.24 shows the ground plate construction before the black paper is attached. You can see the 4” by 5” plastic sheet and the two plastic 1/2” square by 3" long spacers, I used for feet, hot glued to the plastic sheet.

A slit is cut through the center of the plastic sheet for the copper tape to pass through. The top side of the sheet is the working side and the bottom is the connection side. The legs are important; they create

enough space under the ground plate to allow you to connect an alligator clip wire to the copper tape without tilting or making the ground plate unstable.

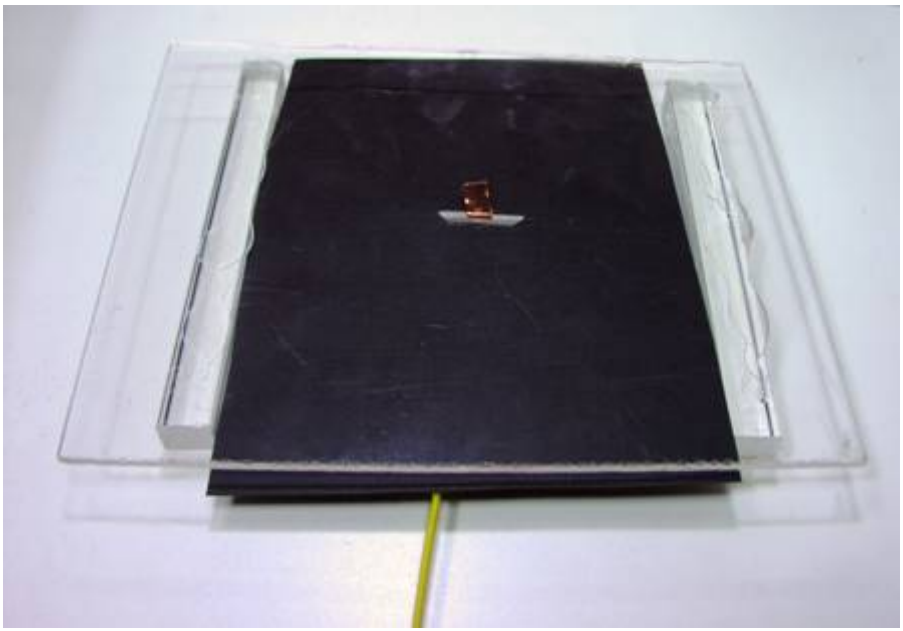


Figure 3.25 – Copper Tape ,black paper placed between plastic legs

To complete the ground plate tape or glue a piece of black non-conductive paper to the underside of the plastic sheet, see Figure 3.25. Using the slit in the plastic sheet as a guide, cut a slit in the paper to pass through the copper tape.

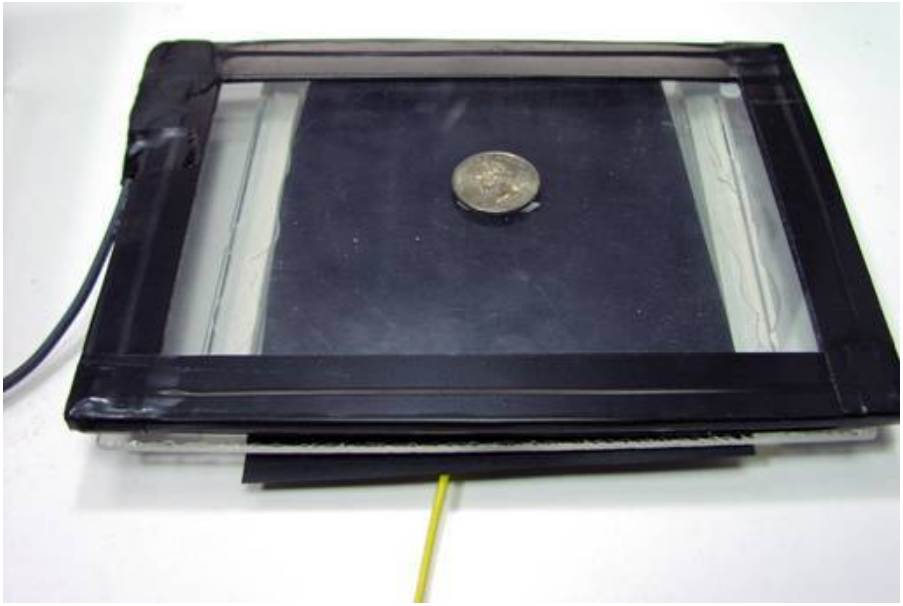


Figure 3.26 – Ground Plate, TDP and Subject ready to make exposure.

To use the ground plate, the object to be photographed is placed on the copper foil on the top side. An alligator clip wire attaches to the copper foil on the bottom side of the ground plate. The other end of the alligator clip wire attaches to an earth ground. The Transparent Discharge Plate is placed on top of the object and ground plate as show in Figure 3.26. The camera is positioned above this set-up ready to take a long exposure picture.

Note: You may be thinking to yourself you can save some steps in making your ground plate by using black plastic or a black foam board. This may not work. Many black materials like black plastic use carbon (also known as graphite) to obtain the black color of the material. Unfortunately carbon is electrically conductive. Having the ground plate made of this material, if it is slightly conductive, will short circuit your object's ground, and the corona discharge will not form properly or fully around the object. If this happens to you, it can be very frustrating and time consuming to Figure out why you're not getting any image or a decent image. I have years of experience shooting Kirlian photographs and it took me an hour or so to trouble shoot this problem back to the ground plate. This particular ground plate was made from black foam board. The black surface of the foam board was only slightly conductive. But at the high voltages involved in Kirlian Photography, it was enough to short circuit my object's ground, thereby preventing a good corona discharge from forming

around the object.

Chapter 4

Digital Camera, iPhone, Video Cameras and Copy Stands

In this Chapter we will look at the specifications of the various cameras you can use to record Kirlian images and video. In addition I will look at a number of copy stands for the cameras, that keep the cameras steady during the long exposures.

The Digital Camera

There are four features you need in a digital camera for still images.

1) **Long exposure times.** The most important feature is the ability for the camera to take long exposures of ten seconds or more. Expensive digital cameras will have a “Bulb” or “B” setting that keeps the shutter open for as long as the shutter button is kept pressed. Long exposure times are necessary to allow the faint light from the electrical discharge to accumulate to form a Kirlian image inside the camera.

2) **Macro Setting.** The macro setting on a digital camera allows you to focus close to the object you are shooting. This is important when shooting small objects like coins and leafs.

3) **Manual Focus.** The manual focus setting allows you to manually focus on a subject, rather than having the camera auto-focus. You will manually focus the camera on the subject you are imaging under normal lighting. Then the room lighting is turned off to take the Kirlian image. Working in a dark room, or having a light tight enclosure over the Kirlian photography set up, is essential for capturing the faint light given off by the corona discharge around the object.

4) **Prevent Built-In Flash.** If your camera has a built in flash it is essential to be able to turn it off when making long exposures.

Digital Camera Copy Stands - Getting Steady to Shoot

Since we are shooting long exposures you need to keep your camera still during the exposure. Because if the camera moves, shakes or vibrates during the exposure you will produce a blurred image.

The solution to this is to use a camera copy stand. I have my copy stand set up so that my camera is facing down, see Figure 4.2. This allows me to work with objects horizontally. I feel setting up the work on a horizontal plane provides the best stability. You also need your objects to be as stable as possible. Because if the object you are imaging moves during the exposure, you will produce a blurred image.

Inexpensive copy stands may be purchased for $10.00 to $25.00. A basic generic camera copy stand that is compatible with digital cameras, iPhone and Video cameras is shown in Figure 4.1 below. This particular copy stand is not heavy and will shake and vibrate easily when handled. Therefore to use this light weight copy stand you will need an external shutter release for your still camera or iPhone. External shutter releases allow you to trip the camera's shutter without physically touching the camera. This will help keep the camera stable. Video cameras don't use a shutter release so they are fine to use with this stand.

Figure 4.1 – Inexpensive Copy Stand Holder compatible with Digital Camera, iPhone & Video

The digital camera will have a mounting hole on the bottom where you can attach the camera to the top of the copy stand, see detail.

Tripods may sometimes be used instead of a copy stand. Tripods work if you hold your discharge plate vertical to the camera plane. Some tripods allow you to position the camera so that it is facing straight down on the horizontal plane. Doing this allows you to set up horizontally.

My standard digital camera copy stand is shown in Figure 4.2, this is a heavy duty unit that is very stable.

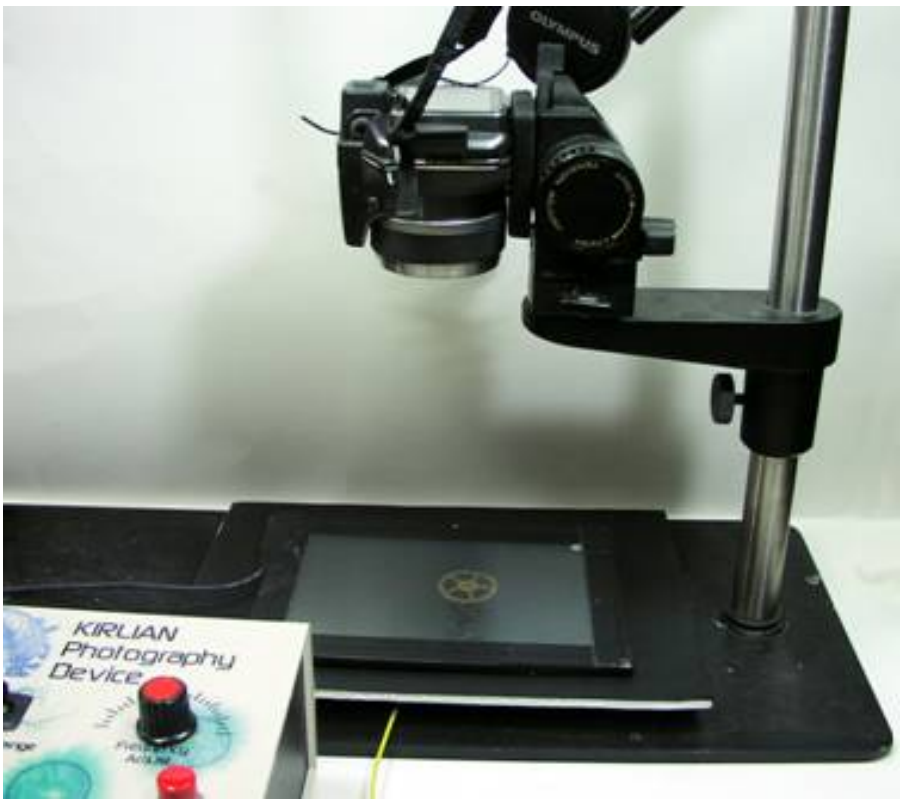


Figure 4.2 – Standard Heavy Duty Copy Stand

iPhone Camera

I have the iPhone 5, so the information I am providing has been tested with that particular iPhone. To use the iPhone to take Kirlian images I use an iPhone app called “MagicShutter”. The "MagicShutter" application allows you to lock focus on an object and manually set your shutter speed and the camera’s exposure time. However, I am sure that if the MagicShutter application is available on your phone model, it will work also.

iPhone Camera Copy Stand - Getting Steady to Shoot

As with the digital camera we need to shoot long exposures to capture the corona discharge. So you need to consider how to keep your iPhone camera steady during the long exposure.

Figure 4.3 – iPhone adapter to secure iPhone to Copy Stand.

There are two solutions, one, you can use the camera copy stand with an adapter that holds an iPhone, or two, make a simple iPhone camera copy stand out of a cardboard box .

The first solution is purchasing an iPhone adapter, see Figure 4.3, which clips the iPhone securely into the adapter, and then the adaptor can be screwed into the copy stand's connector, see Figure 4.4.

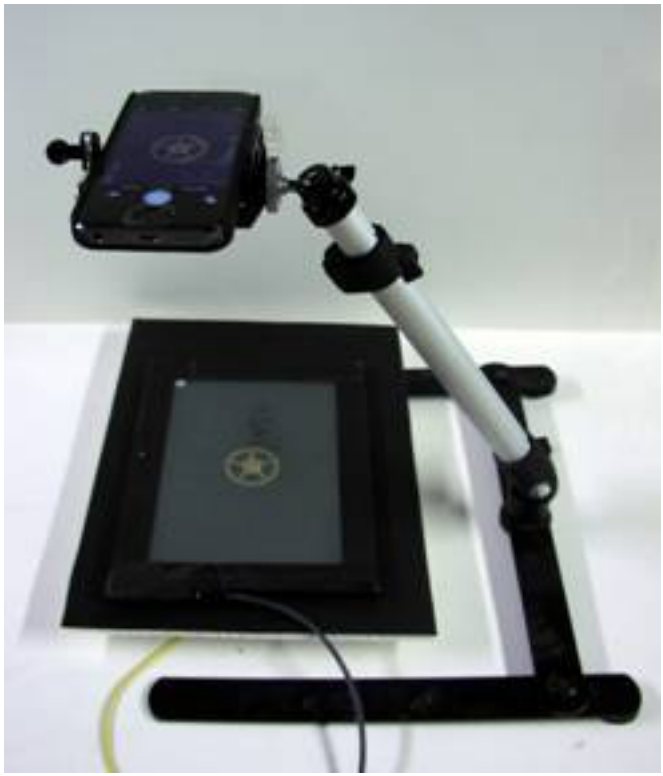


Figure 4.4 – iPhone, adapter, Copy Stand Overview.

Second Solution - Making a Cardboard Box Copy Stand

Copy stands don't have to be complicated devices. You can make a useable copy stand out of a cardboard box. To illustrate, the following directions are for making a iPhone copy stand box. You can use these directions to make a copy stand for your particular camera.

For the iPhone I began with a 7" x 9" x 3" white box.

Figure 4.5 – 7” x 9” x 3” White Cardboard Box

The 3” width of the box is important; it is wide enough for my iPhone to rest on. I taped the edges of the box together, so it will not open up when I am cutting the box. I leave the tape in place when I am finished with the fabrication to make the box more sturdy.

Next I mark the two 7" by 9" sides of the box with a pencil, see Figure 4.6.

Figure 4.6 – Marking the sides to cut out

I drew a large rectangle on each side of the box. I left a 1 inch border from the two sides and top edge of the box. I left a 1/2 inch boarder from the bottom edge. In this particular box, I made the bottom of the box, the side where the flap of the box folds into the box.

Next I cut out the rectangles I just drew on each side of the box with an Exacto knife, see Figure 4.7.

Figure 4.7 – Cutting the panels out with an Exacto knife

With the two rectangles cut out, I then trace the outline of my iPhone on the top of the box. I mark the area inside the iPhone outline where the camera lens is positioned. I then cut out the lens position opening to allow the iPhone camera to look down at the inside bottom of the box, see Figure 4.8.

Figure 4.8 – Marking the iPhone outline and cut out for camera lens

The ground plate and the transparent discharge plate can be placed through the side rectangle cutouts of the box and positioned at the bottom of the box. The iPhone is placed on top of the box ready to take a picture, see Figure 4.9.

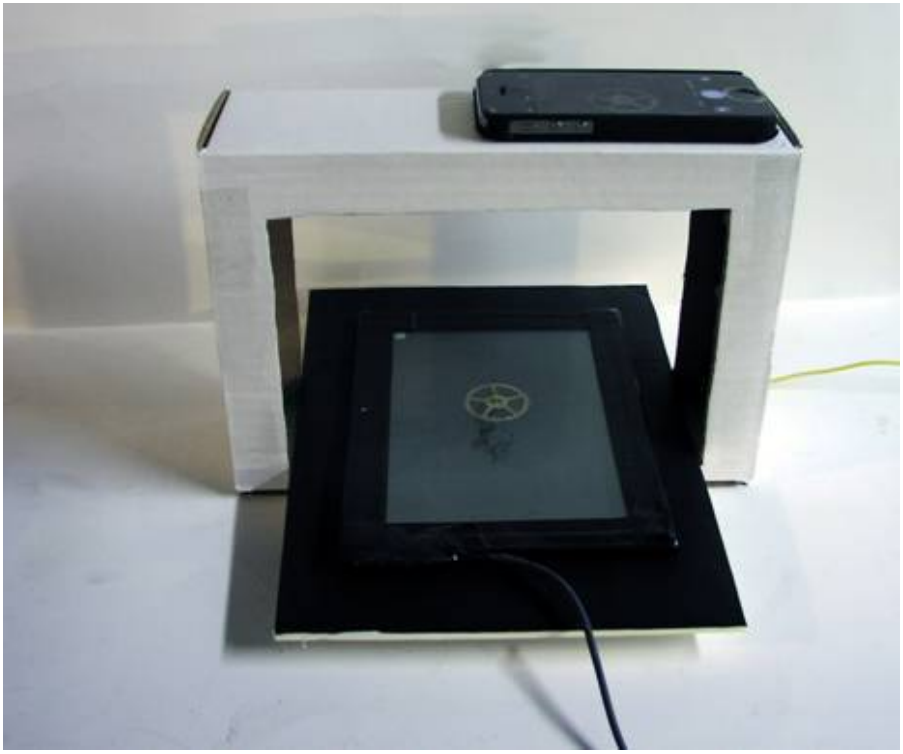


Figure 4.9 – Cardboard iPhone Copy Stand

The iPhone App(s)

In order to use the iPhone to take Kirlian photographs you need to purchase an app that will allow the iPhone camera to take long exposures. There are a few apps that do this. From what I read online, these apps don't actually keep the iPhone shutter open, but instead takes multiple images and accumulate the light in each individual image into the finished picture.

This is a similar stacking technique used in astronomical photography.

The app that I am using is called "Magic Shutter". There are two others apps "Slow Shutter Cam" and "Long Expo", which I have not tried. But reading their specification they seem to me that they may work. I like the MagicShutter app because it has an additional feature that allows you to lock focus on an object in normal room light, before turning the lights off, that is needed to take a Kirlian image.

Video Camera

There are a number of video cameras on the market capable of shooting in the low light generated by the corona discharge. These are sold as low lux video cameras. You need a true low lux video camera. You do not want a video camera that enters a slow or still frame mode to gather light. Nor do you want an infrared night vision camera.

The two video cameras below I have used personally and have obtained good Kirlian imaging results.

B/W Video Camera

Low lux black and white video cameras are less expensive than color video cameras. You want a black and white camera that can see in 0.0003 lux, like the KT&C Sony CCD Model# kpc-ex190-swx, see Figure 4.10. This camera will cost around $100.00 (2016 price) and includes the camera lens.

Figure 4.10 – B/W Video Camera

Sony 1/3" ExView B/W CCD
420TVL Horizontal Resolution
Automatic Gain Control (AGC)
Water-Proof (IP67 Rating)

Automatic Backlight Compensation (BLC)
Low Illumination of 0.0003 Lux / FacePlate
Built-in Reverse Power Input Safety Circuit
Ultra Compact Size of 0.75"(™) Dimension

Color Video Camera

The Sony KPC-650 is a color video camera that can see in 0.05 lux. Not as sensitive as the black and white video camera, but good enough to work. This camera costs about $200.00 without a lens (2016 Price). Add about $50.00 more for a lens. Select a lens that will allow the camera to focus on a 5” by 5” area at a close distance of 12 inches or less. This will allow the camera to be positioned close to the Kirlian photography set up to obtain good detail of the object you are imaging.

Figure 4.11 –Color Video Camera

Color Box Type Camera
Sony 1/3" ExView Color CCD
550TVL Horizontal Resolution
C/CS Mount / Vari-Focal C/CS Mount Lens
Min. Illumination of 0.05 Lux / Faceplate
Automatic Tracing White Balance (ATW)
Automatic Gain Control (AGC)
Backlight Compensation (BLC)

Newer Video Cameras

The two video cameras I have highlighted are older models that I have used. An internet (or eBay) search for low lux video cameras will turn up newer cameras that are more light sensitive and less expensive than the cameras I have listed. I have seen color cameras like KPC-650BH working at 0.0003 lux and black and white cameras like the KT&C 750TVL working down to .000001 lux. I am sure these video cameras are fine, and may obtain better images than I have obtained with my cameras, but I have not used these cameras.

Chapter 5

Shooting Kirlian Images

No Lights, Action, Camera

What was that? No lights? Yes that's right, no lights. In order to capture and record the feeble light of the corona discharge, namely Kirlian images, you need close to complete darkness when making your exposure. How do we do that? We have a few options, shooting in a light tight room or using a light tight cover over your Kirlian photography set-up, (camera, subject and transparent discharge plate).

The simplest option is to shoot in a windowless room, where you can turn off the lights and have relative darkness. If the room you are planning on working in has a window, you could black out all light from the window or maybe you could shoot Kirlian photographs at night.

The second option is to build a light tight cover for your Kirlian equipment so you can shoot in a lighted room. And there are a few ways to do this also. The simplest is to set up the shot and to drape a light tight black cloth over the equipment and shoot. Near the end of this Chapter, I will show you how to build a simple light tight enclosure for less than $10.00 out of black foam board. The light tight enclosure is designed to cover a Kirlian photography set-up.

The following picture taking information is assuming you're working in a light tight room. The procedures for shooting images is almost the same as when using a light tight cover. The differences will be detailed later.

Shooting using Digital Camera

Set up your camera, copy stand, ground plate, object, transparent discharge plate and high voltage power supply, see Figure 5.1.

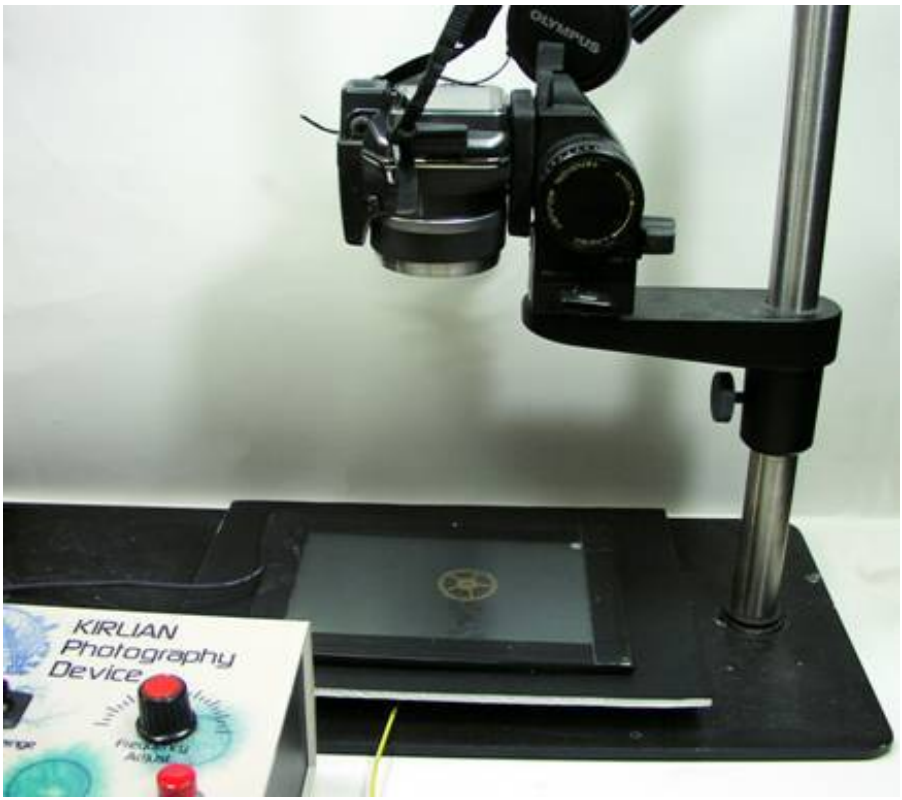


Figure 5.1 – Digital camera and copy stand set up.

If you are imaging an inanimate object such as a leaf or coin, you want to attach a ground wire to the object to obtain a bright corona discharge around the object.

Have A Ground Plate:

If you made a ground plate, now is the time to use it. Place the object on the small piece of copper foil tape on the top side of the ground plate. Attach the alligator clip wire to the copper foil protruding from the bottom of the plate. Attach the other end of the alligator clip wire to an earth ground.

Don't Have A Ground Plate:

If you do not have a ground plate, place a piece of black non-conductive paper on the surface where you will be shooting. The black paper provides a perfect background for obtaining the best image of the corona discharge. Next place the object on top of the black paper. Attach a wire, connected to an earth ground to the inanimate object you are shooting

Continuing with the Kirlian Set Up:

You will be shooting the object through the transparent discharge plate, that is placed on top of the object.

When placing the transparent discharge plate on the object, place the tin oxide side of the glass in the transparent discharge plate toward the object. This way the corona discharge only needs to travel through the .010 thickness of the plastic sheet. If you place the discharge plate, the opposite way down, with glass side toward the object, the corona discharge would need to travel through .125 inch of glass and 0.010 thickness of plastic, reducing the brightness of the corona discharge.

If you purchased a Transparent Discharge Plate, the tin oxide glass side has a colored dot on it. Place the color dot side toward the object when placing the transparent discharge plate on the object..

Attach the high voltage lead from your power supply to the transparent discharge plate.

Position your camera above the object and transparent discharge plate and frame the object as you want it to appear in the finished photograph. Set your camera to manual focus. Then manually focus on the object with the room lights on. If you have the option of setting your F-Stop, set the F-Stop to its lowest numerical setting. This will open the aperture of the camera to let in as much light as possible. Next set the camera shutter speed, set it to an long exposure time of 10 seconds. I think ten seconds is an ideal time to start.

Turn off the room lights. Turn on the power of your high voltage power supply. If your high voltage power supply has a frequency adjustment, adjust the frequency to obtain the best corona discharge around the object. Then trip the camera's shutter. Keep high voltage power applied to the transparent discharge plate for the full 10 seconds of the exposure. Sometimes during the exposure you may want to vary the frequency of the high voltage power supply, to record different corona effects, the changes in frequency may cause.

After the exposure you can turn on the room lights. Most digital cameras allow you to view the pictures you have taken. If so, you can evaluate your Kirlian photograph in your digital camera. You can make adjustments to the exposure time if necessary. For instance if the corona is too bright, you can reduce the exposure time. Or if the corona wasn't bright enough you can increase the exposure time. Digital cameras allow you to quickly evaluate your images and re-shoot.

Figure 5.2 – Digital camera picture.

Because we are shooting in open air, which is a nitrogen rich atmosphere, the corona discharge is a blue-ultraviolet color, and is recorded as such onto our equipment. The pretty colors, vibrant reds, oranges and greens obtain with sheet film, is the false coloration created by the corona discharge activation of the color dye layers in the film. While digital photographs are not as colorful as sheet film renditions, the corona discharge captured through the transparent discharge plate is more accurate. In addition, the images can be imported into photo-editing software such as Adobe Photoshop to be manipulated and re-colored.

Shooting Kirlian images using your iPhone

The procedure is pretty similar to the digital camera procedure. I assume you are using the Magic Shutter app. Set the exposure time to 15 seconds. With the room lights on, frame the image of the object in the camera view. One disadvantage of the Magic Shutter App is that you cannot zoom in on an object to photograph it. Allow the camera to focus on the object and then lock the focus. This will insure your object stays in focus when you turn off the room lights. This is a great feature, almost as good as manual focus.

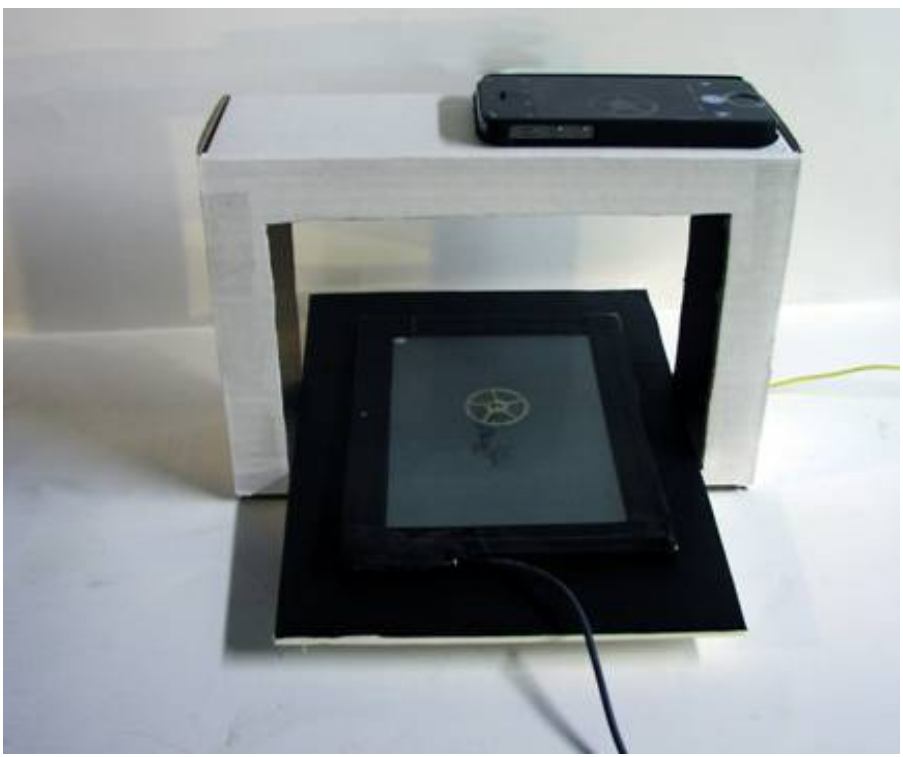


Figure 5.3 – iPhone camera and copy stand set up.

Turn off the room lights. Turn on the power of your high voltage power supply. If your high voltage power supply has a frequency adjustment, adjust the frequency to obtain the best corona discharge around the object. Then trip the iPhone's shutter. Keep high voltage power applied to the transparent discharge plate for the full 15 seconds of the exposure. Sometimes during the exposure you may want to vary the frequency of the high voltage power supply, to record different corona effects, the changes in frequency may cause.

After the exposure you can turn on the room lights. View the image you have taken for evaluation. You can make adjustments to the exposure time if necessary. For instance if the corona is too bright, you can reduce the exposure time. Or if the corona wasn't bright enough you can increase the exposure time.

Figure 5.4 – iPhone camera images.

The main reason the iPhone picture of the U.S. quarter (Figure 5.4) is not as high resolution as from the digital camera, is that I could not zoom in on the quarter. The image in Figure 5.4 is cropped out of the full image. The full image captured by the iPhone is shown in Figure 5.5.

Figure 5.5 – iPhone camera full picture view uncropped.

There are two obvious solutions to this problem. One is to position the iPhone camera as close as possible to the subject, and still remain in focus. I tried this later when testing the light tight enclosure; you can compare the differences in the pictures, Figures 5.4 and 5.5 to the pictures shown in Figure 5.13.

The second solution is to purchase a macro lens adapter for the iPhone camera, that will allow close up photography.

Shooting Real Time Video

Shooting real time video through the transparent discharge plate is also possible. However it requires the use of a low lux video camera as discussed in Chapter 4.

We can use the same set-up; camera copy stand, subject and transparent discharge plate, for shooting video as was used for the iPhone and digital camera. The video camera is mounted above the transparent discharge plate set-up as shown in Figure 5.6. This will provide perfectly good real time video.

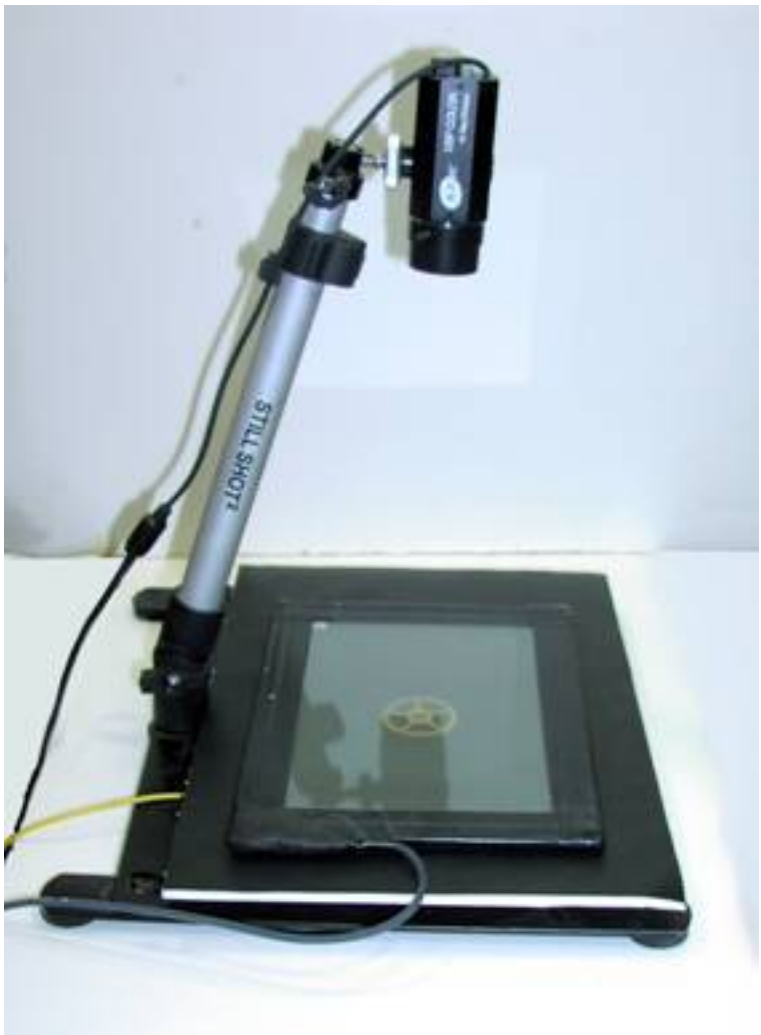


Figure 5.6 – Color video camera set-up.

For anyone interested in pursuing this type of photography you can start by looking at this Youtube tutorial video I created: https://www.youtube.com/watch?v=FLU3agfVGfE

Figure 5.7 – Still frame from video camera.

Shooting People's Kirlian Aura's

Sooner or later you are going to want to take Kirlian photographs of people. Do not take a Kirlian image or make a high voltage exposure of anyone with a heart condition or any type of implanted electrical device such as a pacemaker. The high voltage may affect the electrical device.

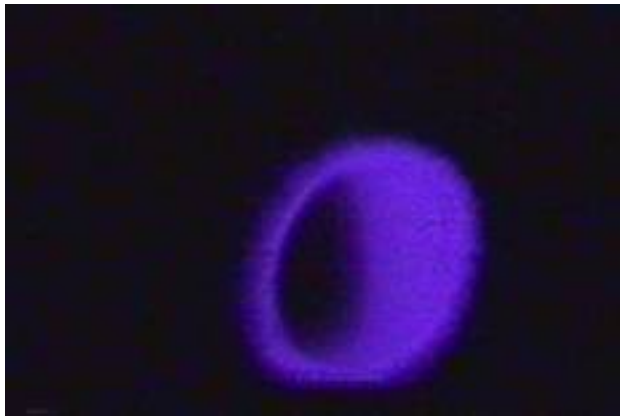
To shoot a person's Kirlian aura, start with imaging the person's fingertip. Make sure the person, or live subject, you are photographing does not touch or come in contact with a ground during the high voltage exposure. Grounding during this time will cause excessive electrical power to flow through the person and cause an electrical shock. Also do not place too much surface area of the person on the transparent discharge plate. For instance, placing the whole hand on the transparent discharge plate, will dissipate the corona discharge so much, that the light from the discharge will be to weak that it is not practical to obtain an image even with a long exposure time.

When I shoot people's finger tips I reverse the position of the camera and transparent discharge plate, see Figure 5.8. The camera is on the base surface, pointing up toward the transparent discharge plate. The transparent discharge plate is elevated above the video camera using a small stand. The transparent discharge plate, is placed on the stand, with the tin oxide side facing up. When one touches the plate, the corona discharge only needs to travel through the .010 thickness of the plastic sheet. This allows the corona discharge to be brighter than if touching the opposite side of the transparent discharge plate. The image below shows the set up I use to record real time video of fingertips.

This set up allows you to capture the full corona discharge from the fingertip easily.

Video Set-up

Figure 5.8 – Video camera set-up for shooting finger tips.



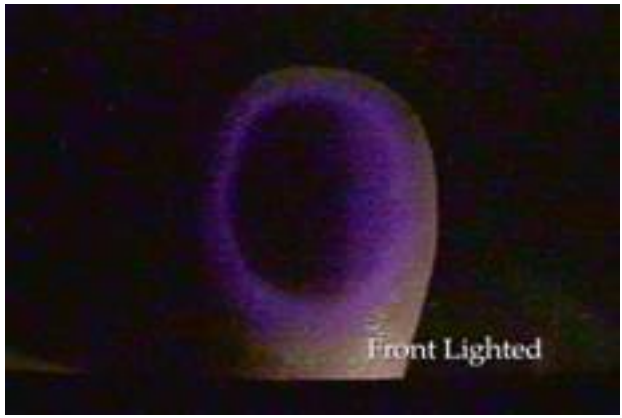


Figure 5.9 – Fingertip still frames from video camera.

Light Tight Covers

Using a light tight cover or enclosure over a Kirlian photography set up, presents a new challenge to the photographer. First and foremost is triggering the shutter on the digital camera or iPhone enclosed in a light tight enclosure. Video cameras are not much of a problem, as the video output from the camera operates continuously. Triggering the shutter on a digital camera or iPhone enclosed in a light tight enclosure has a few solutions.

Self Timer

One solution, is to set a self timer on the camera to about 60 seconds. With the self timer set to 60 seconds, means that the camera will take the picture 60 seconds after you trigger the shutter. The Magic Shutter App for the iPhone includes a self timer that you can set. For your digital camera you need to look up the self timer in the digital camera's manual. Most modern digital cameras have this feature. The procedure is to set up the shot, trigger the self timer, then cover the imaging setup with the light tight enclosure, then activate the high voltage power supply during the exposure for the shot.

Eternal Shutter Release (Cable)

A better solution is to use an external shutter release cable. Or the more modern version of the external shutter release cable, the wireless shutter release. For your particular digital camera you need to check to see what eternal shutter release accessory is available. For the iPhone you can use a headset with volume controls as an external shutter release cable.

When the iPhone is in camera mode, hitting the volume control on the headset microphone, triggers the shutter. You can purchase an inexpensive headset for the iPhone, and clip off the ear buds to make a dedicated shutter release cable. A nice Bluetooth wireless option for the iPhone is the MuKu Shuttr,

http://www.amazon.com/gp/product/B00JK5OW8C/

Simple Soft Light Tight Cover

A simple light tight cover can be made from black cloth material. The black cloth must be light tight and electrically non-conductive. The material can be draped over your photography set up to shield it from room light. Black velvet is one cloth material that comes to mind. The

procedure to shoot an image is to set up the shot, set manual focus and exposure. Cover the photography set up with the black cloth, turn on the high voltage power supply and trip the camera's shutter. When the exposure is complete, turn off the high voltage power, remove the cover and check the resulting image.

To improve the soft cover design and if you can sew, cut the black cloth into four or five shapes that when sewed together form a basic tent shape.

Simple Light Tight Cover from Black Foam Board

A simple hard shell light tight cover can be made from black foam board. Black foam board is sold in a number of pre-cut rectangles. I used 11" x 14" x 3/8 inch thick. Foam boards are extremely light and durable. I hot glued the pieces of foam board together to create the light tight enclosure. The gluing method that I found to be the best is to run a bead of hot glue along the entire edge of the foam board and attach it to the second foam board. See the following sequence of drawings. Start with five pieces of black foam board, 11" x 14" x 3/8 inch thick.

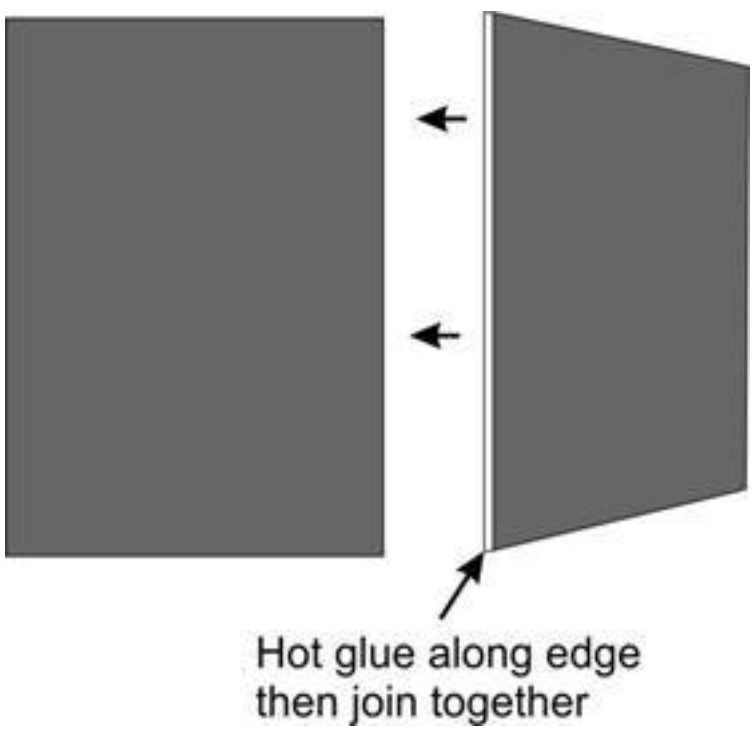


Figure 5.10 -- Construction of light tight cover (1)

Place a bead of hot glue along the edge of one side of the black foam board. Glue the two boards together as shown in Figure 5.10 making a 90 degree angle with both boards, forming a corner of the enclosure.

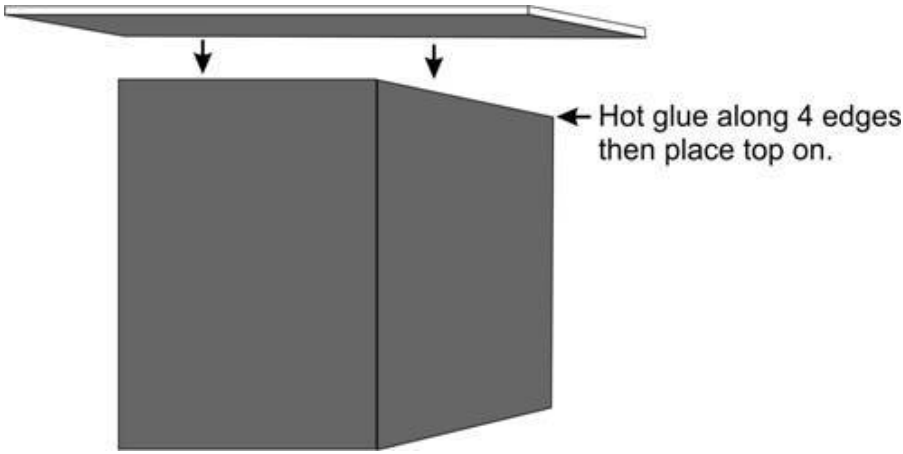


Figure 5.11 -- Construction of light tight cover (2)

Continue in this manner until you have joined four pieces together, creating an open ended box. Then place a bead of hot glue along the top edge of the four sides, then place the fifth piece of foam board down, as shown in Figure 5.11, securing it to the four sides to make the box's top.

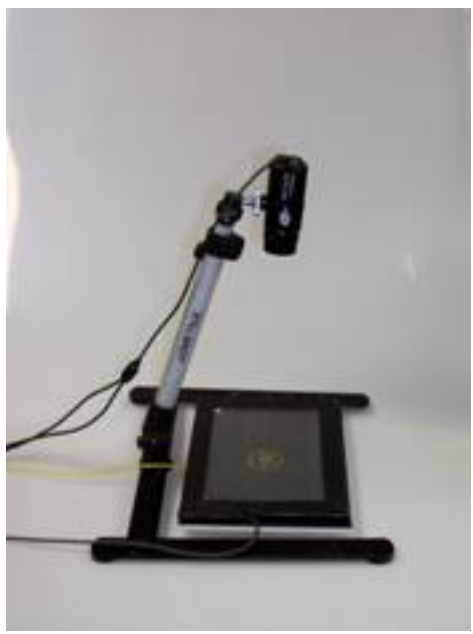


Figure 5.12

The light tight box fits over the Kirlian camera setup and transparent discharge plate.

Making the Light Tight Box Light Tight

The joined edges of the enclosure, that are hot glued together, in most cases will leak light inside the box. Hold the box up to a light source and look at the inside of the box. See light leaking in from the corners? If so, we need to fix this and make the enclosure light tight. Cover the outside edges of the box with black electrical tape. This should make the box light tight. Check by holding the box up to a light source and looking inside the box.

When using the light tight box, depending upon your set-up, you may have wires or cables coming out from underneath the box. These wires will lift the box slightly and may cause light to leak in. To fix this, I recommend cutting a small notch in the bottom of one side of the box. The notch should only be large enough to allow the wires and cable to pass underneath without lifting the box. Then get a piece of black cloth and secure a few inches of material above the notch so that the material drapes over the notch and extends a few inches outward from the box. This material will prevent light from leaking in from the notch and any wires passing through it.

Light Tight Box - Try Out

I set up my iPhone camera, and decided to reshoot the Kirlian image of the U.S. quarter. I used the light tight box and an external shutter release to the iPhone. The Magic Shutter iPhone app was set to 8 seconds. I moved the U.S. quarter as close to the camera lens as the auto focus of the iPhone would allow and still keep the focus. Locked the focus and took an image. Here are my results:

Figure 5.13

The image on the left is cropped and the image on the right is uncropped. You can compare the size of the subject in these images in Figure 5.13 to the size of the subject in original images in Figures 5.4 and 5.5, to see how much closer I was able to photograph the quarter. While the image is a significant improvement over the first iPhone Kirlian image, there is much one can do to improve the image further. I did forget to clean the iPhone camera lens before shooting the image. The camera settings on the Magic Shutter were not optimized for this particular shot. And a macro lens for the iPhone camera should also make an improvement.

What to Shoot

Now that you know how to shoot Kirlian images, your question becomes, what do I shoot. Most small metallic objects are good subjects, coins are an excellent example, but paper clips, brass gears, earrings etc. work well also. Plants and leaves are favorites of Kirlian photographers, as are wedges of fruits and vegetables. Typically you are looking for subjects that have some electrical conductivity; whether that conductivity comes from metal, as with coins, or from water, as with leaves, doesn't matter.

There is also a list of what not to image, or I should say, the difficult to image. Nonconductive objects are difficult to obtain a corona discharge around, and therefore image, these include subjects like plastics, rocks and hair.

Gallery

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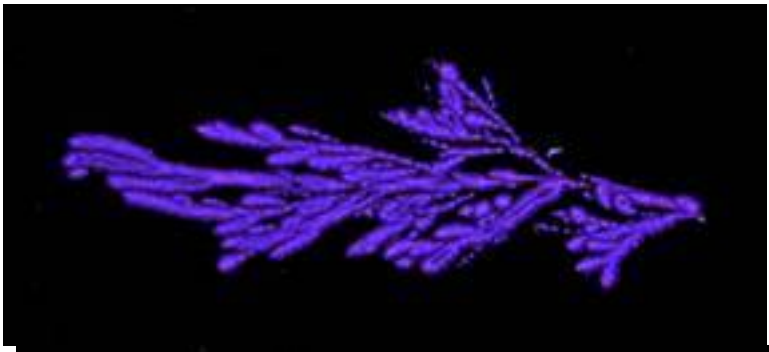
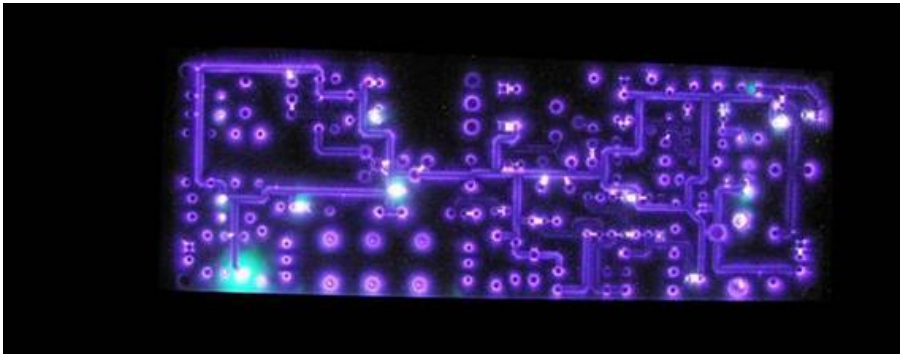
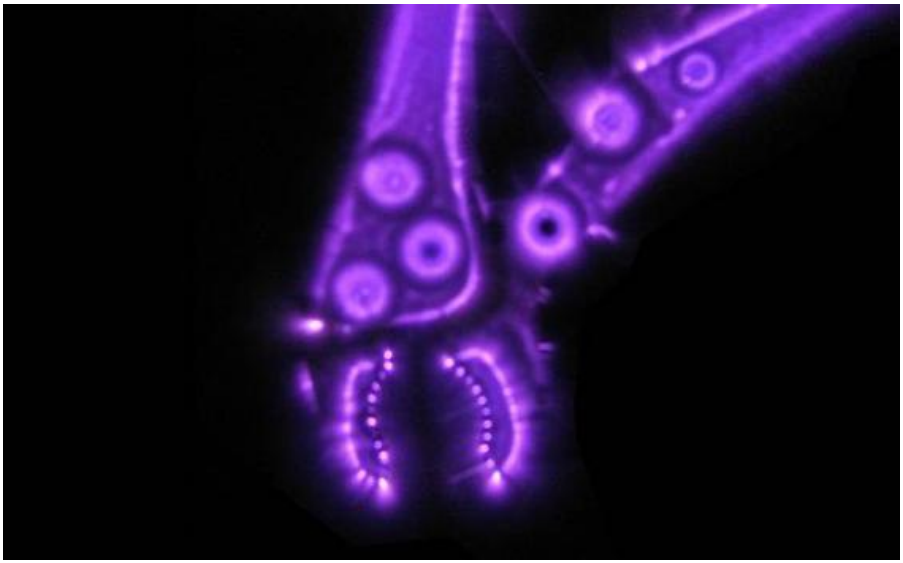
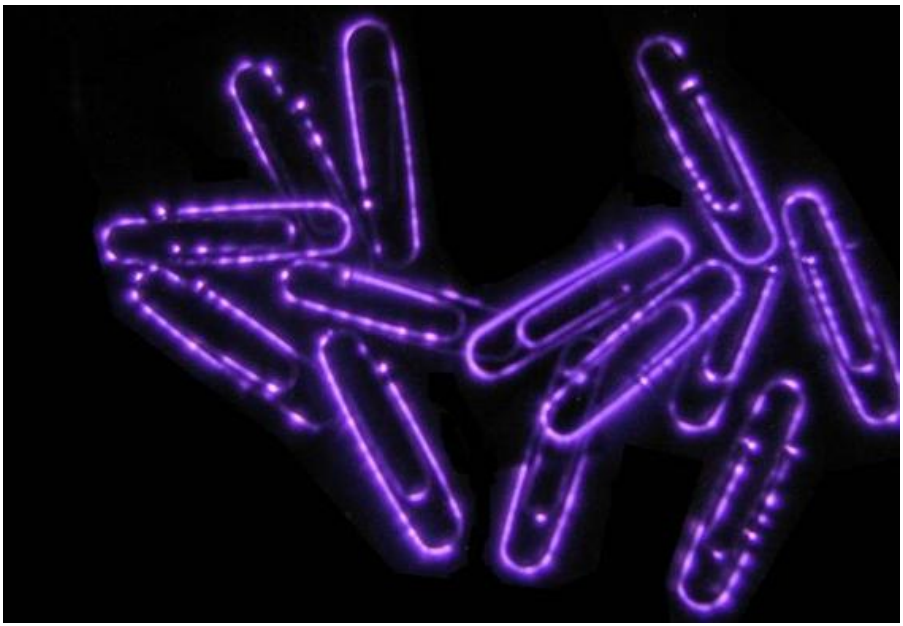
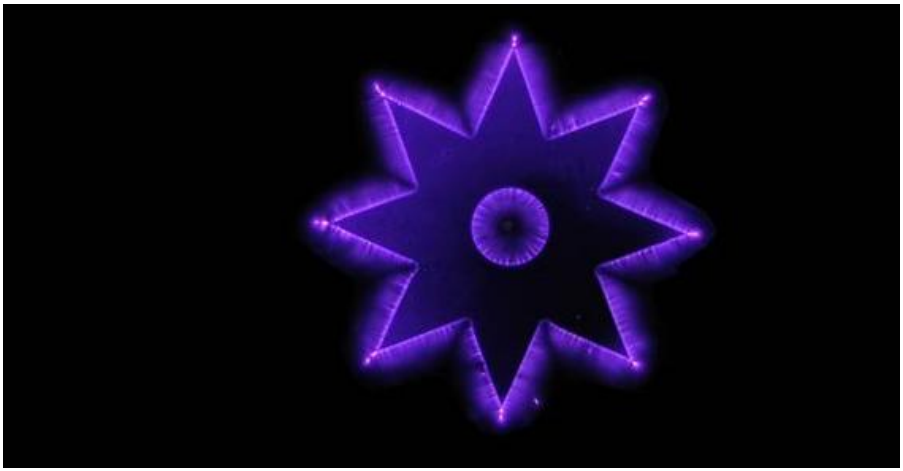
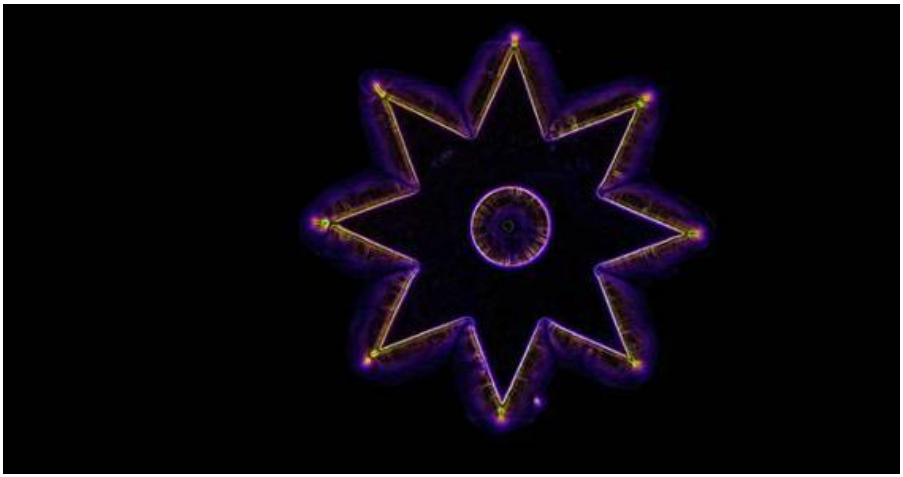












Learning More about Kirlian Photography

If you want to learn more about Kirlian photography, I recommend my other book Kirlian Photography Fact and Fiction.

There are links to private documentary videos contained within the book.

Chapter 6

Clearing up Noise in Digital Photographs:

The digital camera I used for the majority of this book's images, has a maximum shutter exposure time of 16 seconds. Even with this short exposure time, the camera's CCD element accumulates a significant amount of digital noise, that is incorporated in the resulting image. This digital noise consists of random pixels of various colors and shades, sprinkled throughout the image. You can clean up the image by removing as much digital noise as is possible. If you have access to photo-editing software like Adobe Photoshop, it will help you in cleaning up the digital noise. The examples provided in this Chapter were made using Adobe Photoshop 5.0.

Here are the steps I used to remove noise:

1) Starting with base image of leaf, Select: Image à Adjust à Brightness/Contrast (See Figure 6.1.)

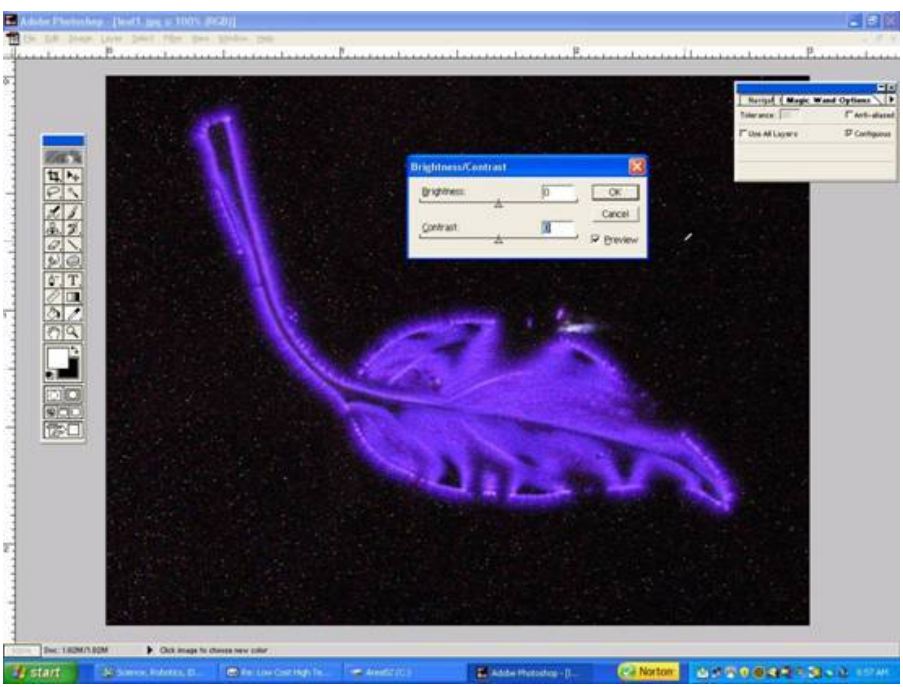


Figure 6.1

2) Increase contrast to brightened image, as in Figure 6.2.

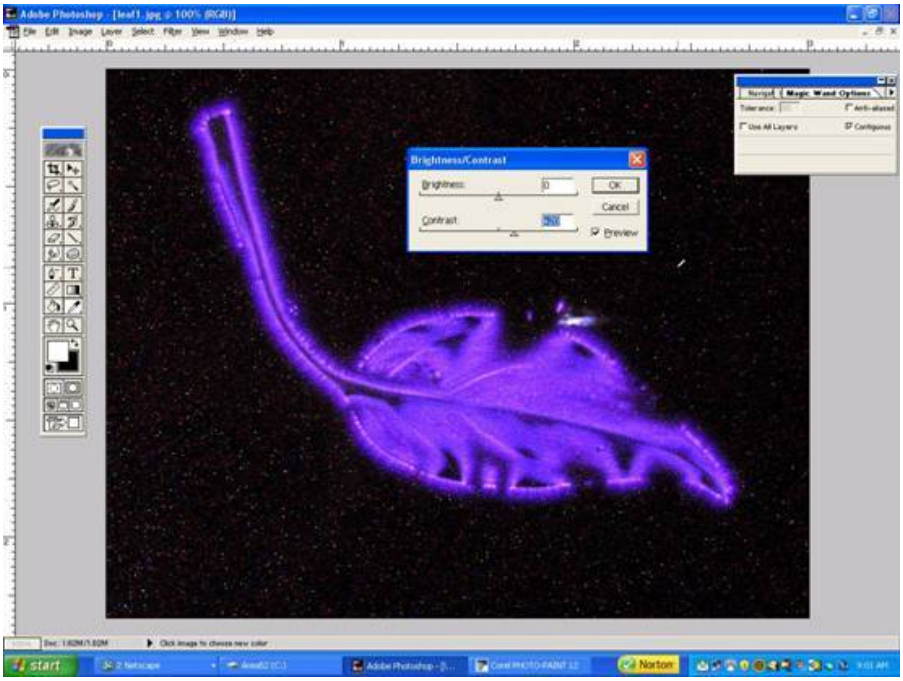


Figure 6.2

3) Zoom picture to 500% so you can clearly see the background pixel noise. Using the Magic Wand (set want to 30 tolerance), click on a noise pixel. In Figure 6.3. I choose a red noise pixel.

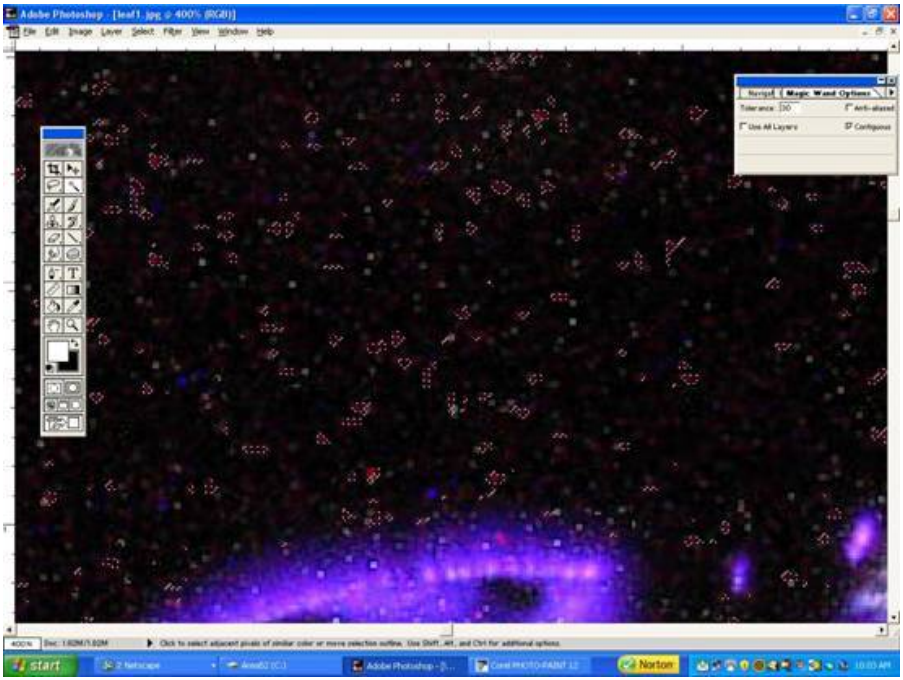


Figure 6.3

4) With the noise pixel selected, go to Select à Similar. Now all the pixels with that color in the photograph will be selected. See Figure 6.4

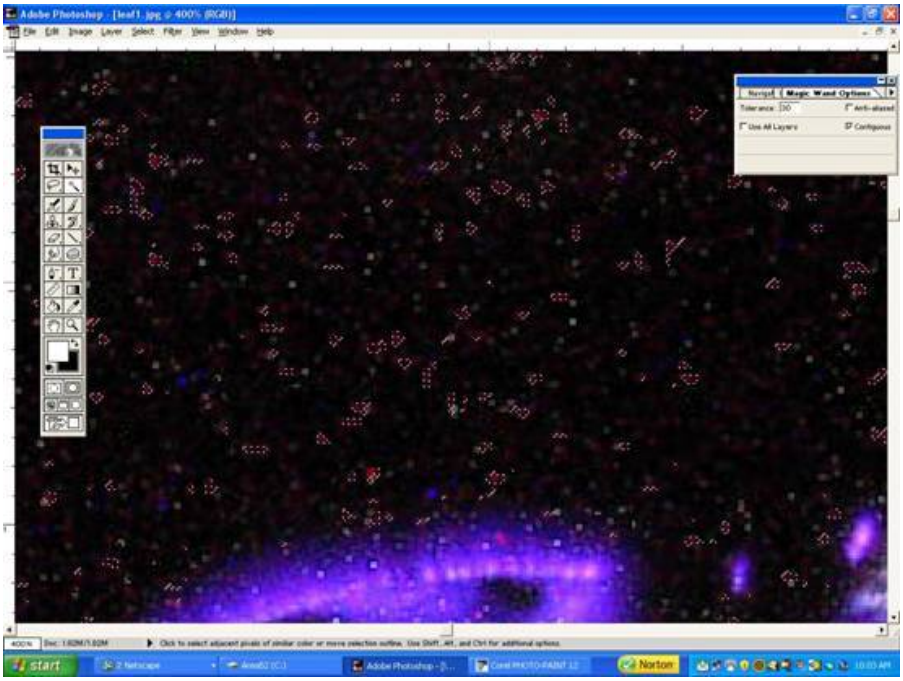


Figure 6.4

5) Set foreground to black and hit the delete key. All the selected noise pixels will be colored black. See Figure 6.5.

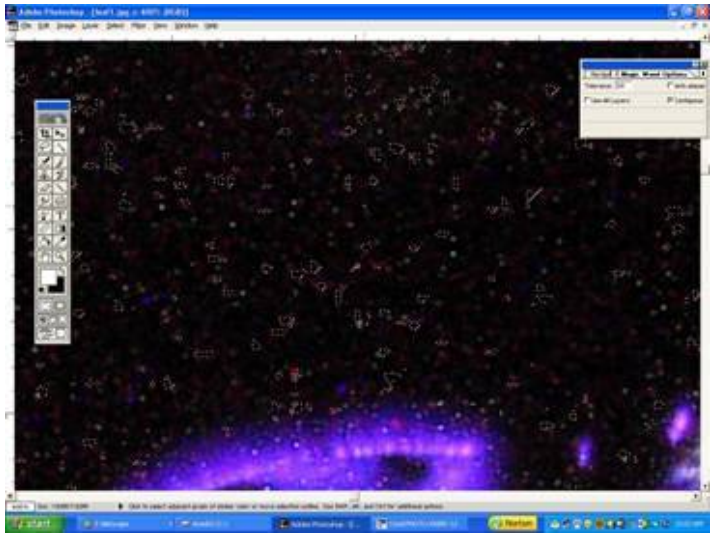


Figure 6.5

6) Continue in this manner, clicking on various colored noise

pixels, Selecting similar and deleting them to black. Be careful not to select any noise pixel that is the same color or shade of color used in the main image you are trying to enhance.

Figure 6.6 shows a leaf section with the noise background in the original photograph and cleaned up.

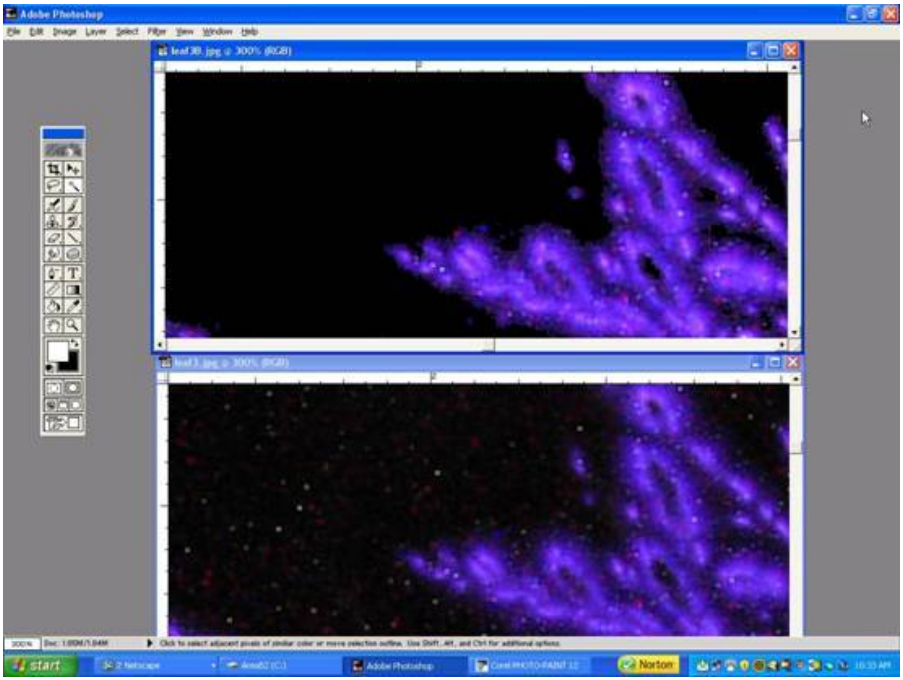


Figure 6.6

Coloration

Your photographs are mostly blue-violet with a little white. This is due to the fact that the corona discharge in nitrogen (air is 78% nitrogen) generates blue to UV light.

You can use the color balance feature of Photoshop to change the color of your image.

Select: Image à Adjust à Color Balance.

Change the slider for the colors you can adjust the color balance for the; Shadows, Midtones and Highlights.

Figure 6.7 is the starting image.

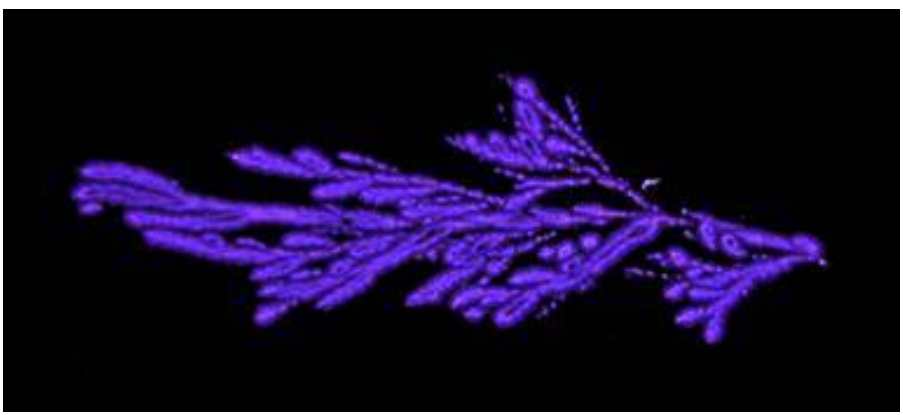


Figure 6.7

Figures 6.8 and 6.9 have their color balance manipulated.

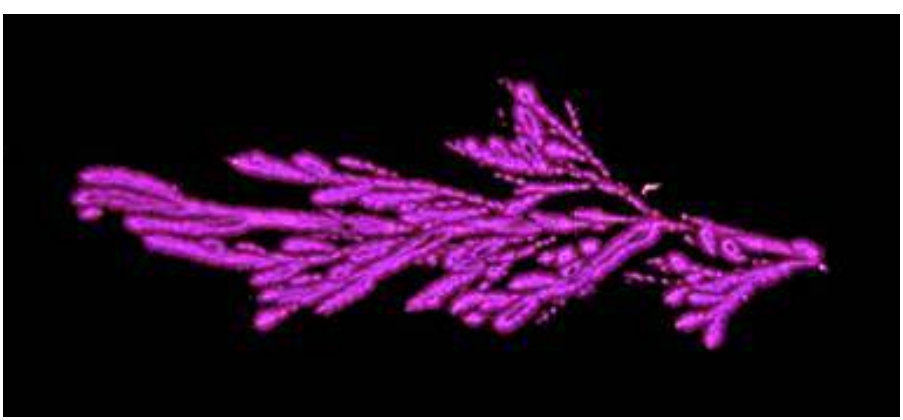


Figure 6.8

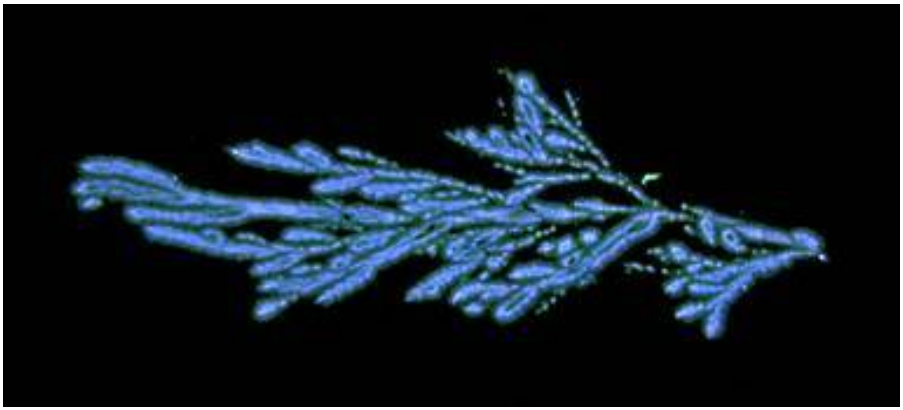


Figure 6.9

Going Further

There are additional methods one may use to manipulate Kirlian images using Adobe Photoshop. Try the various filters for interesting effects.

Chapter 7

Kirlian Art Prints for Fun and Profit

Fortunately for you there are not many photographers pursuing Kirlian photography. This allows you greater latitude for creating fine art Kirlian prints that are acceptable for publication and for sale.

You have Kirlian prints that range in the thousands of dollars like Walter Chappell prints selling for $3200.00 on Amazon.com

https://www.amazon.com/Walter-Chappell-Parsley-Kirlian-Platinum/dp/B019BVLOIU/ref=sr_1_3?ie=UTF8&qid=1466435859&sr=8-3&keywords=fine+art+kirlian

You also have more budget priced “Limited Edition” Kirlian prints for $99.95.

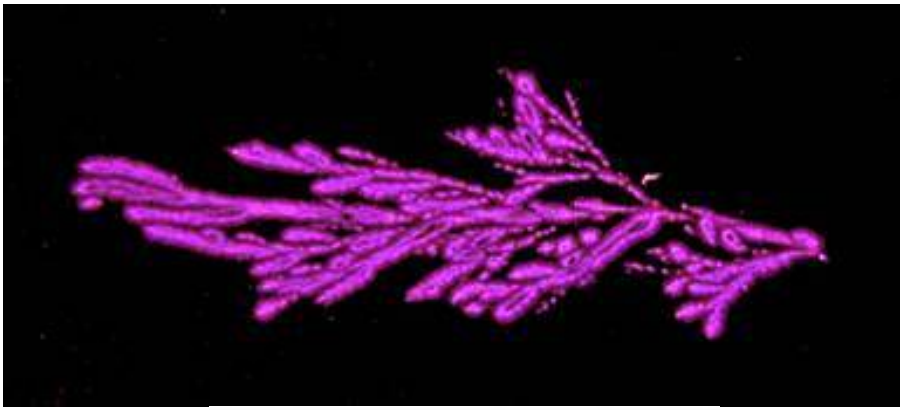
https://www.amazon.com/Kirlian-Maple-Leaf-Limited-Edition/dp/B0092GH8NK/ref=sr_1_cc_2?s=aps&ie=UTF8&qid=1466436146&sr=1-2-catcorr&keywords=kirlian+prints

Figure 7.1 -- Canvas Print

And naturally you have fine art prints priced in between.

Printing on Media

Kirlian images may be printed on paper, calendars, cards, canvas, cups, tee shirts, mouse pads, bags and pretty much anything else you can think. Another fertile field are image transfers of Kirlian images onto various surfaces like: metal, wood, plastics and glass.



Markets

You can offer your Kirlian artwork on craft sites like Etsy, major retailers like Amazon.com, Art Galleries and studios, local craft shows, and of course your own website.

Resources

There are many companies that print on media, I have included a few below:

https://www.shutterfly.com/

http://www.vistaprint.com/

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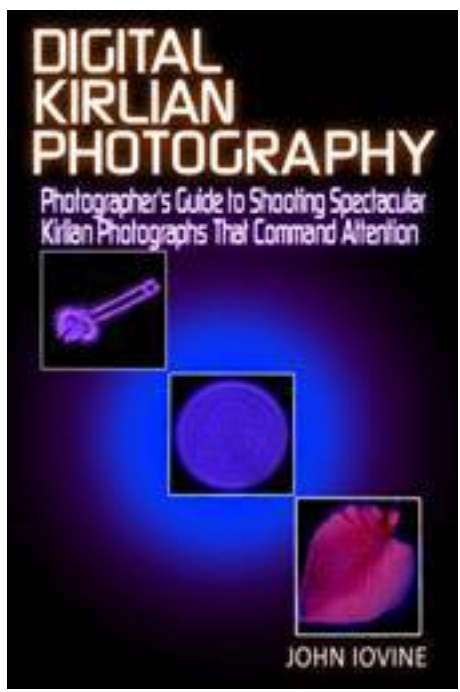
I always appreciate honest reviews and feedback from my readers. The link to write a book review is below, click on it.

Thank you,

John Iovine



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